HQIM Bid Package: Secondary Science

Created for Mississippi Department of Education
August 2025

Brady Svec –Territory Sales Representative
brady.svec@pearson.com

Subjects & Titles Included

MS Course Code	Grade Level/Subject	Suggested Pearson Title	Format	Digital Platform
260131	**Biology**	Campbell Biology: Concepts & Connections, ©2021	print + digital	Mastering®
400519	**Chemistry**	Introductory Chemistry, ©2024	print + digital	Mastering®
260628	**Foundations of Biology**	Campbell Biology: Concepts & Connections, ©2021	print + digital	Mastering®
260751	**Human Anatomy and Physiology**	Human Anatomy & Physiology, ©2025	print + digital	Mastering®
260625 260626	**Marine and Aquatic Science I and II**	Essentials of Oceanography, ©2020	print + digital	Mastering®
400700	**Physical Science**	Conceptual Integrated Science, ©2020	print + digital	Mastering®
400820	**Physics**	Conceptual Physics, ©2022	print + digital	Mastering®

Presentation Video

Secondary & AP Science: Biology

https://youtu.be/aifI_FWDImA

Secondary & AP Science: Chemistry & Physics

https://youtu.be/Aen0aPdxyZ0

Physical Science & AP Environmental Science

https://youtu.be/w9iN1wBslXk

Human Anatomy & Physiology

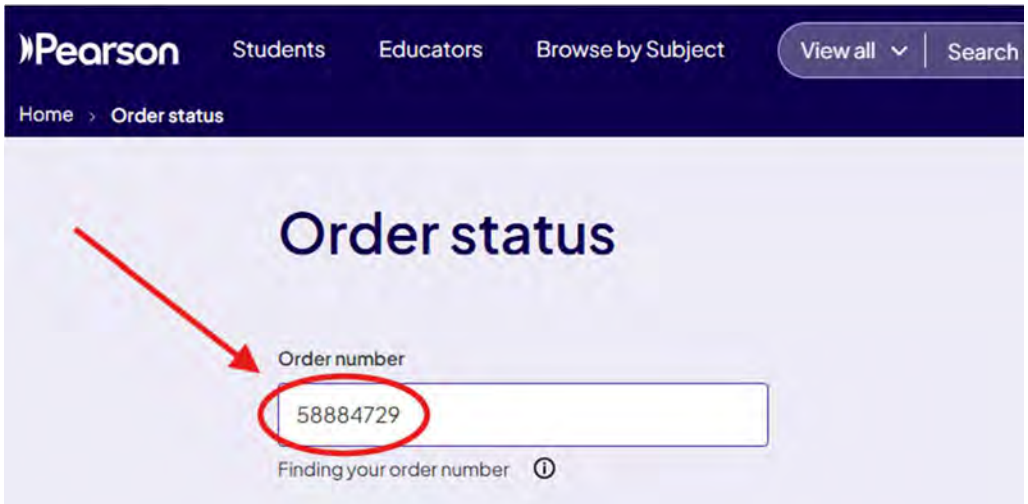
https://youtu.be/uTms4KOZbF4

Marine & Aquatic Science I & II

https://youtu.be/vYQObw0578Q

Physical Sample Information

Pearson has provided physical samples of the textbooks in this section (pupil edition and teacher edition, if printed teacher edition is available). The Pearson order number for the shipment is: **58884729**. Details and tracking numbers can be found on our Order Status Page after entering the order number (58884829).



Pearson Order Status Page

At the time of submission, the items below are backordered. However, they are scheduled for shipment/delivery before the state textbook committees meet in mid-September.

Ordered Item	Item Description	Status	Schedule Ship Date
9780137922642	Introductory Chemistry, ©2024	Awaiting Shipping	9/2/2025
9780138249359	Human Anatomy & Physiology, ©2025	Awaiting Shipping	9/3/2025

Campbell Biology: Concepts & Connections, 10th Edition

By: Martha R. Taylor, Eric J. Simon, Jean L. Dickey, Kelly A. Hogan, Jane B. Reece

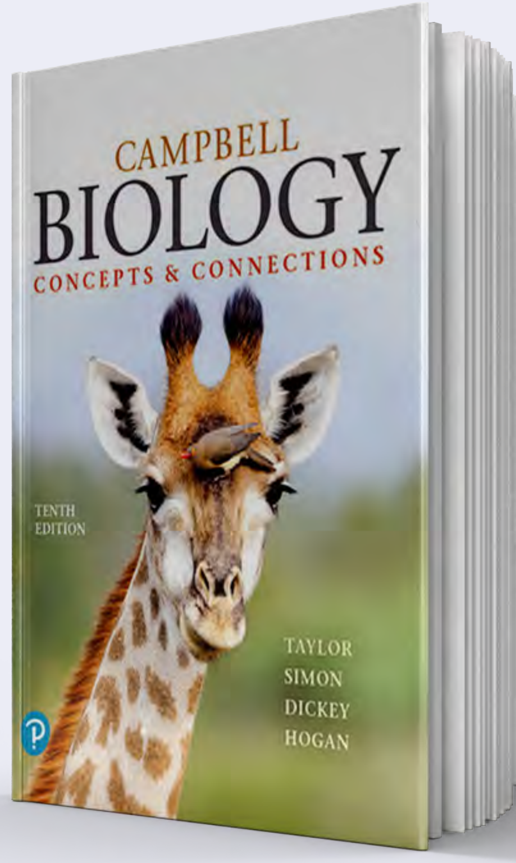
Making Biology Meaningful, Modular, and Connected.

Campbell Biology: Concepts & Connections provides a clear and engaging introduction to biology for today's high school students. Organized around key concepts and themes, the 10th Edition offers a flexible, modular structure that makes learning accessible—connecting biology to real-world issues.

Drawing from the authors' classroom experiences and the latest research in learning science, this edition features updated content, a visual-rich learning experience, and enhanced digital resources to help students engage, apply, and master key biological concepts.

Features of the program:

- **Big Ideas and Chapter Openers** provide a clear roadmap of what students will learn.
- **Connection Modules** bridge biological content to real-world scenarios.
- **Scientific Thinking Modules** encourage critical thinking and evidence-based reasoning.
- **Figure Walkthroughs** guide students through complex visuals using narrated explanations, markups, and scaffolded questions.
- **Visualizing the Data & Concepts** modules help students interpret and analyze scientific visuals.
- **Mastering® Biology** offers interactive tutorials, simulations, and real-time feedback for a personalized, active learning experience.
- **Robust Analytics** allow teachers to monitor student progress and adjust instruction with precision.
- **Pearson® Interactive Labs and Active Reading Guides** extend learning through hands-on and guided activities.



Pearson Mastering

An immersive and adaptable online learning platform that empowers students to learn through active and engaging experiences. With personalized tutorials, analytics, and feedback, Mastering® helps high school students develop a strong foundation in science and engineering programs.

Pearson

Table of Contents:

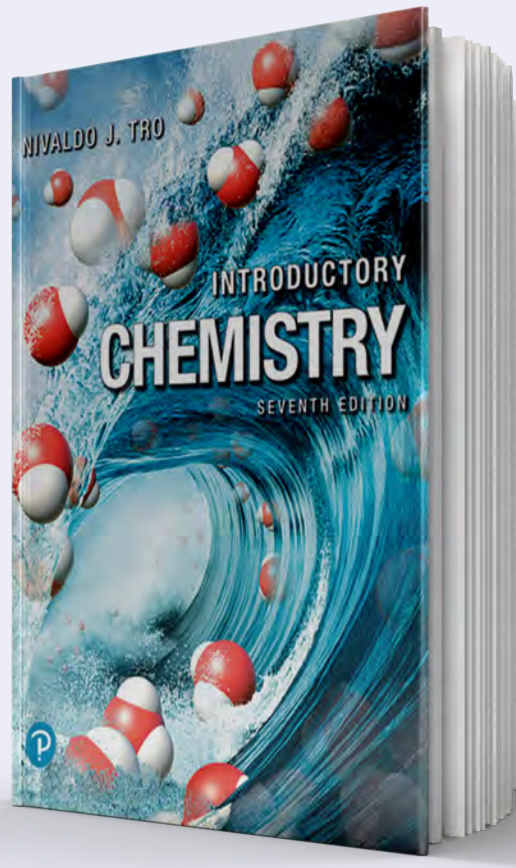
ISBN List

9780135447789	Student Edition + Modified Mastering with Pearson eText -- 1 Year
9780136646099	Student Edition + Modified Mastering with Pearson eText -- 6 Year
9780137452484	HS Digital Modified Mastering with Pearson eText -- 1 Year
9780137452545	HS Digital Modified Mastering with Pearson eText -- 6 Year

Pearson

Introductory Chemistry, 7th Edition

By: Nivaldo J. Tro



Making Chemistry Meaningful

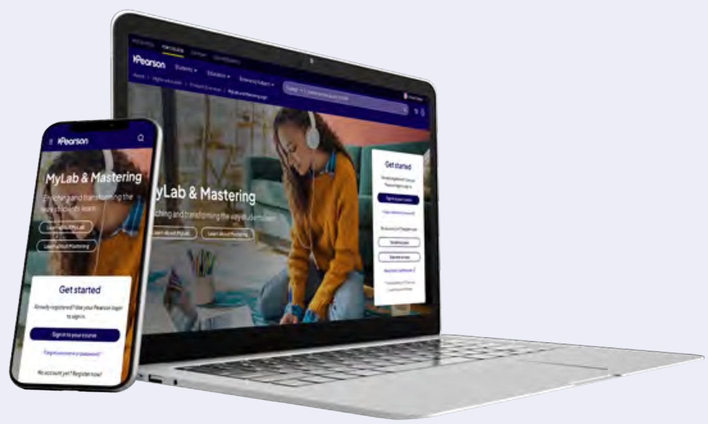
Introductory Chemistry, 7th Edition presents chemistry as a relevant and engaging subject—anchored in real-world applications and accessible to all learners. Written by renowned educator Nivaldo J. Tro, this program helps high school students build a solid foundation in chemistry through clear instruction, inclusive examples, and robust problem-solving strategies.

With interactive visuals, guided examples, and a consistent 4-step problem-solving approach, this program empowers students to approach chemistry with competence and confidence.

Features of the program:

- **4-Step Problem-Solving Process** (Sort, Strategize, Solve, Check) develops structured thinking for tackling chemistry problems.
- **Worked Examples and Solution Maps** walk students through key steps and deepen understanding.
- **Visual Representations** connect microscopic, macroscopic, and symbolic views of matter.
- **Predict This! Quizzes** encourage self-assessment and reflection at the end of each chapter.
- **End-of-Chapter Questions** are updated with graph- and data-based problems to support critical thinking.
- **Mastering® Chemistry** provides personalized tutorials, simulations, and analytics that guide students toward mastery. **eText Features** include 15 Key Concept Interactives for immersive learning, 45 Key Concept Videos with 2D and 3D animations, and 78 Interactive Worked Examples for real-time application.

Pearson Mastering



An immersive and adaptable online learning platform that empowers students to learn through active and engaging experiences. With personalized tutorials, analytics, and feedback, Mastering® helps high school students develop a strong foundation in science and engineering programs.

Table of Contents:

ISBN List

9780135448052	Student Edition + Modified Mastering with Pearson eText - - 1 Year
9780137922642	Student Edition + Modified Mastering with Pearson eText - - 6 Year
9780137922697	HS Digital Modified Mastering with Pearson eText -- 1 Year
9780137922659	HS Digital Modified Mastering with Pearson eText -- 6 Year

Pearson

Human Anatomy & Physiology, 12th Edition

By: Elaine N. Marieb, Katja Hoehn

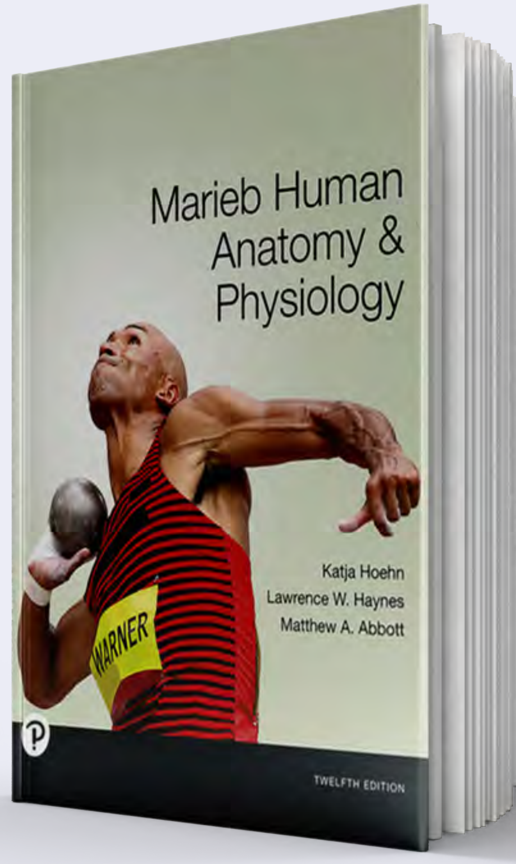
Bridge the Gap from Concept to Clinical Care.

Human Anatomy & Physiology, 12th Edition delivers the foundational knowledge high school students need to succeed in health science courses and beyond. With clear explanations, updated clinical content, and real-world application, this program prepares students to understand the human body.

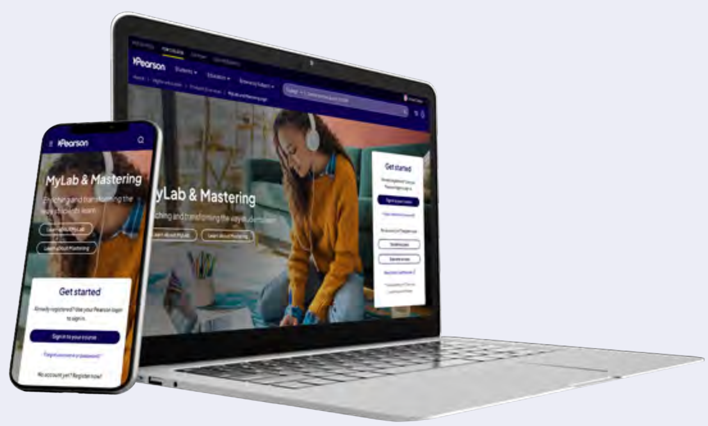
The latest edition reflects advances in the field, promotes critical thinking, and includes immersive digital learning tools to reinforce anatomical understanding and physiological processes.

Features of the program:

- **Clinical Case Studies** challenge students to apply knowledge in real-world health care scenarios.
- **Chapter Roadmaps** and **Illustrated Tables** offer visual overviews and serve as effective study guides.
- **Focus Figures** break down complex processes using clear visuals and step-by-step explanations.
- **Check Your Understanding Questions** reinforce understanding of key concepts.
- **Mastering® A&P** provides interactive reading assignments, figure animations, Dynamic Study Modules, Practice Anatomy Lab (PAL) 4.0, and career connection videos to deepen understanding. Mastering also includes Active Reading Guide worksheets to support students actively reading the text.



Pearson Mastering



An immersive and adaptable online learning platform that empowers students to learn through active and engaging experiences. With personalized tutorials, analytics, and feedback, Mastering® helps high school students develop a strong foundation in science and engineering programs.

Pearson

Table of Contents:

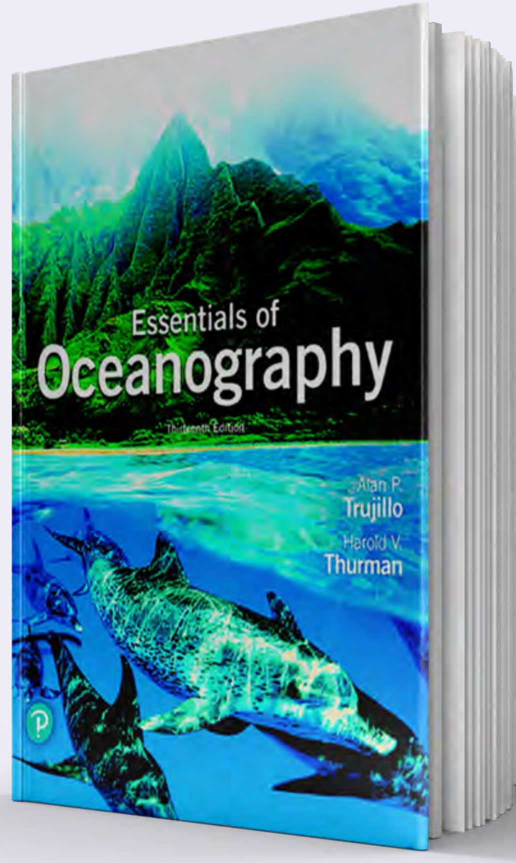
ISBN List

9780135448137	Student Edition + Modified Mastering with Pearson eText - - 1 Year
9780138249359	Student Edition + Modified Mastering with Pearson eText - - 6 Year
9780138249366	HS Digital Modified Mastering with Pearson eText -- 1 Year
9780138249373	HS Digital Modified Mastering with Pearson eText -- 6 Year

Pearson

Essentials of Oceanography, 13th Edition

By: Alan P. Trujillo, Harold V. Thurman



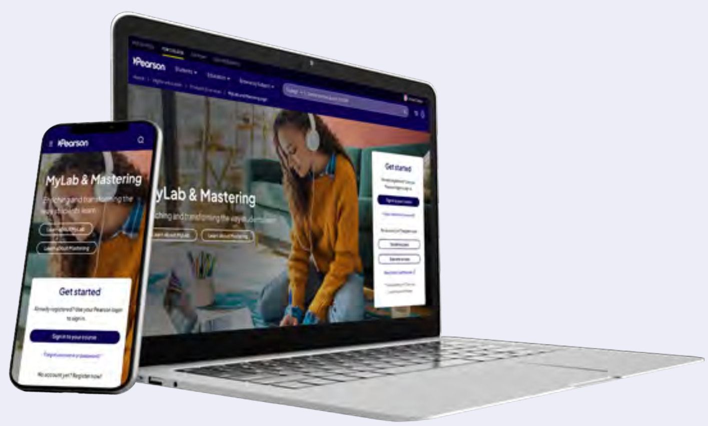
Engage Curiosity. Explore the Science of the Sea.

Essentials of Oceanography, 13th Edition presents oceanography as an interdisciplinary science and examines the role of oceans within Earth's global systems. The text covers geology, chemistry, physics, and biology as they relate to the study of the ocean. The goal is not just to present facts, but to help students understand ocean systems and their interactions with other Earth systems like the atmosphere and biosphere. Emphasizing a systems approach, the program aims to show how human activities impact these interconnected systems and why understanding ocean processes is essential.

Features of the program:

- **Process of Science** features illustrate the scientific method by highlighting an area of oceanographic inquiry and explicitly pointing out how the process of science was used in that case; each feature also includes a critical thinking assessment question.
- **Exploring Data** questions direct students to engage with data and checks their understanding by asking data interpretation questions related to data-rich figures, graphs, tables, and maps.
- **Diving Deeper Boxes** highlight real-world examples and captivating stories.
- **Data-Rich Figures, Graphs, and Maps** enhance understanding of key concepts.
- **Critical Thinking Questions** and **Active Learning Exercises** work well as group activities that students can complete in class.
- **Mastering® Oceanography** offers Dynamic Study Modules, MapMaster3, Animations, GraphIt activities, and Oceanography Videos to enhance student engagement with the material and allow for effective self-assessment.

Pearson Mastering



An immersive and adaptable online learning platform that empowers students to learn through active and engaging experiences. With personalized tutorials, analytics, and feedback, Mastering® helps high school students develop a strong foundation in science and engineering programs.

Pearson

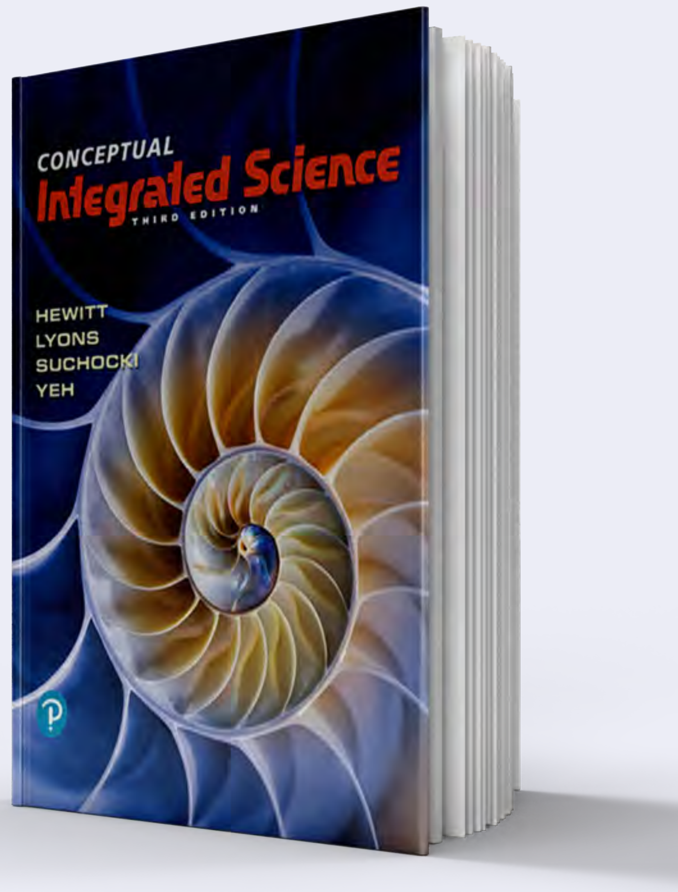
Table of Contents:

ISBN List

9780135447567	Student Edition + Modified Mastering with Pearson eText - - 1 Year
9780135257586	Student Edition + Modified Mastering with Pearson eText - - 6 Year
9780137453153	HS Digital Modified Mastering with Pearson eText -- 1 Year
9780137453184	HS Digital Modified Mastering with Pearson eText -- 6 Year

Conceptual Integrated Science, 3rd Edition

By: Paul G. Hewitt, Suzanne A. Lyons, John A. Suchocki, Jennifer Yeh



A Big-Picture Look at Science—Made Clear and Connected.

Conceptual Integrated Science, 3rd Edition offers high school students a unified understanding of biology, chemistry, physics, earth science, and astronomy through clear explanations, real-world examples, and engaging visuals. This interdisciplinary approach helps learners connect key ideas across scientific domains, building curiosity and confidence along the way.

With margin notes, modern technology highlights, and flexible instructional tools, this edition makes it easy to teach—and easy to learn.

Features of the program:

- **Integrated Sections** use diagrams and visual cues to connect scientific ideas across disciplines.
- **End-of-Chapter Questions** reinforce understanding and are revised for clarity and depth.
- **Technology Boxes** spotlight advances such as CRISPR gene editing, wind turbines, and heat-resistant glass.
- **Real-World Connections** throughout the text support relevance and retention.
- **Mastering® Physics** includes adaptive tutorials, simulations, and immediate feedback designed to aid skill development. It also offers Author-Created Video Tutorials that allow students to preview and review each chapter. Check-Yourself Questions and personalized eText tools are available for student self-assessment.

Conceptual Integrated Science, 3rd Edition supports foundational science instruction across disciplines and prepares students for interdisciplinary thinking in STEM pathways.

Mastering Physics

An immersive and adaptable online learning platform that empowers students to learn through active and engaging experiences. With personalized tutorials, analytics, and feedback, Mastering® Physics helps high school students develop a strong foundation in science and engineering programs.

Pearson

Table of Contents:

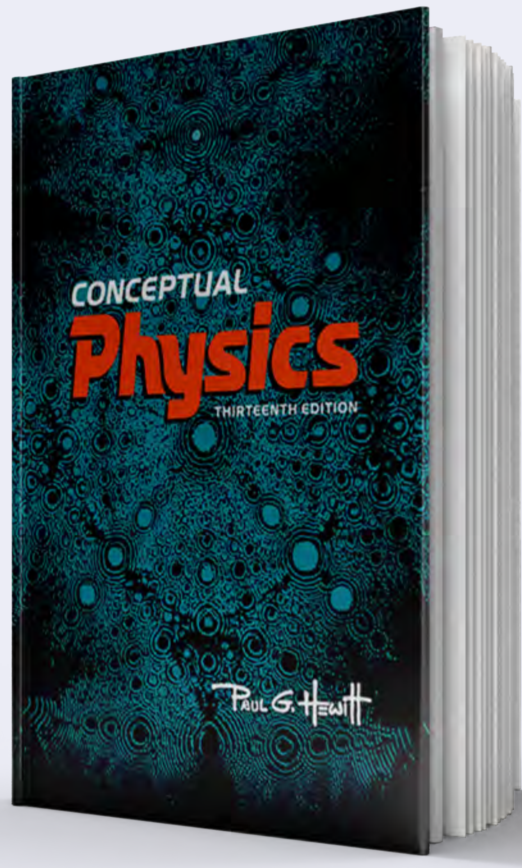
ISBN List

9780135447512	Student Edition + Modified Mastering with Pearson eText- - 1 Year
9780135239865	Student Edition + Modified Mastering with Pearson eText - - 6 Year
9780137452231	HS Digital Modified Mastering with Pearson eText-- 1 Year
9780137452347	HS Digital Modified Mastering with Pearson eText -- 6 Year

Pearson

Conceptual Physics, 13th Edition

By: Paul G. Hewitt



Master the Concepts Before the Calculations.

Conceptual Physics, 13th Edition brings physics to life for high school students. With an emphasis on real-world analogies, engaging visuals, and concept-before-calculation instruction, this trusted program empowers students to grasp the fundamental principles of physics before tackling the math.

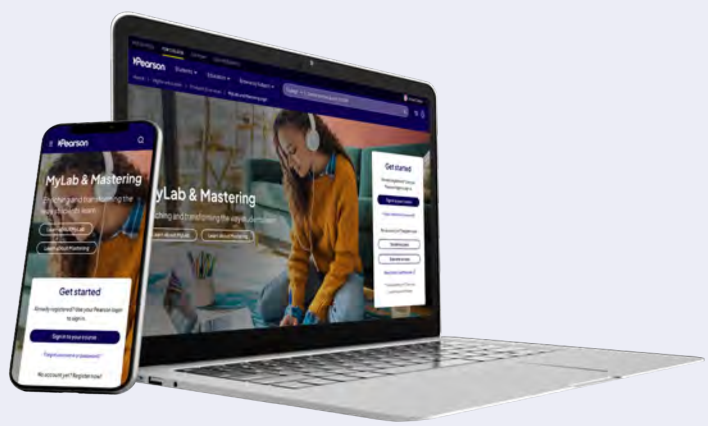
From classical mechanics to modern physics, the program blends humor, imagination, and everyday relevance—building scientific literacy and confidence through conceptual clarity and hands-on exploration.

Features of the program:

- **Practicing Physics Boxes and Hands-On Applications** promote scientific exploration and critical thinking.
- **Hewitt-Drew-It Screencasts** and real-world photo Chapter Openers support a visual approach to learning.
- **Check Yourself & Conceptual Ranking Questions** help reinforce understanding through self-assessment and formative review.
- **Expanded Instructor Resources** support implementation and instructional planning.
- **Mastering® Physics** provides adaptive practice, instant feedback, and personalized learning tools, including practice exams, videos, study modules, flashcards, and interactive figures.

Conceptual Physics, 13th Edition supports foundational physics instruction for high school students preparing for further study or STEM careers.

Mastering Physics



An immersive and adaptable online learning platform that empowers students to learn through active and engaging experiences. With personalized tutorials, analytics, and feedback, Mastering® Physics helps high school students develop a strong foundation in science and engineering programs.

Pearson

Table of Contents:

ISBN List

9780135447819	Student Edition + Modified Mastering with Pearson eText- - 1 Year
9780136913955	Student Edition + Modified Mastering with Pearson eText - - 6 Year
9780137452590	HS Digital Modified Mastering with Pearson eText- - 1 Year
9780137452606	HS Digital Modified Mastering with Pearson eText - - 6 Year

Curriculum Scope & Sequence

Scope & Sequence: Pearson – Campbell Biology: Concepts and Connections, © 2021

Course Name: Biology (260131) Grades 9-12

**The number of class periods assumes approximately 45-minute class periods. Schedule calculations are based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.*

Note: This scope and sequence is based on a 180-day calendar and includes instructional time for all units aligned to the 2018 Mississippi Biology Standards.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 1: The Life of the Cell **Textbook Chapters:** Chapters 1–7 **Overview:** This unit introduces the scientific study of life. Students explore unifying characteristics of living things, biological organization, chemical foundations, and the fundamental processes that sustain life in cells. Topics include the structure and function of macromolecules, cell types and organelles, cell membranes, enzyme activity, photosynthesis, and cellular respiration.	**Class Periods:** 47	BIO.1A.1 – Differentiate between living and nonliving things. BIO.1A.2 – Describe the tenets of cell theory and the contributions of scientists. BIO.1A.3 – Explain organization from cells to systems. BIO.1A.4 – Evaluate whether viruses are living or nonliving. BIO.1B.1 – Compare and contrast structure/function of macromolecules. BIO.1B.2 – Investigate enzyme activity under different conditions. BIO.1C.1 – Model organelle interactions for life functions.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
		BIO.1C.2 – Compare cell types (prokaryotic vs. eukaryotic, plant vs. animal). BIO.1C.3 – Contrast viruses and cells. BIO.1D.1 – Demonstrate cell membrane transport mechanisms. BIO.1D.2 – Model cell response to solute imbalances. BIO.2.1 – Model ATP/ADP energy transformation. BIO.2.2 – Model photosynthesis. BIO.2.3 – Model aerobic and anaerobic respiration. BIO.2.4 – Compare aerobic and anaerobic respiration.
Unit 2: Cellular Reproduction and Genetics **Textbook Chapters:** Chapters 8–12 **Overview:** This unit explores how cells reproduce and how genetic	**Class Periods:** 37	BIO.1E.1 – Model how cell division and differentiation maintain complex organisms. BIO.1E.2 – Describe changes in cells during the replication process.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
information is passed from one generation to the next. Topics include mitosis, meiosis, DNA structure and replication, gene expression, inheritance patterns, non-Mendelian genetics, and biotechnology.		BIO.1E.3 – Relate cellular reproduction to asexual reproduction. BIO.3A.1 – Model meiosis and fertilization. BIO.3A.2 – Compare mitosis and meiosis. BIO.3A.3 – Explain chromosomal abnormalities. BIO.3B.1 – Use Punnett squares to demonstrate Mendelian genetics. BIO.3B.2 – Apply the law of independent assortment. BIO.3B.3 – Model non-Mendelian inheritance. BIO.3B.4 – Interpret pedigrees and population data. BIO.3C.1 – Model DNA, genes, and chromosomes. BIO.3C.2 – Evaluate transcription and translation.
Unit 3: Concepts of Evolution **Textbook Chapters:** Chapters 13–15 **Overview:** This unit focuses on how	**Class Periods:** 18	BIO.4.1 – Explain how natural selection leads to adaptation. BIO.4.2 – Support common ancestry and evolution with evidence.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
populations evolve over time. Students examine evidence for evolution, mechanisms such as natural selection and genetic drift, and how species form. They also explore how evolutionary relationships are traced and interpreted.		BIO.4.3 – Analyze fossil and anatomical evidence. BIO.4.4 – Explain biological classification and evolutionary relationships.
Unit 4: Evolution of Biological Diversity **Textbook Chapters:** Chapters 16–19 **Overview:** Students explore the evolution and classification of prokaryotes, protists, fungi, plants, and animals. This unit emphasizes structure, function, evolutionary adaptations, and ecological roles of diverse organisms.	**Class Periods:** 17	BIO.6.1 – Compare domains and kingdoms. BIO.6.2 – Explain how adaptations relate to survival. BIO.6.3 – Classify using dichotomous keys. BIO.6.4 – Interpret evolutionary relationships with cladograms.
Unit 5: Animals: Form and Function **Textbook Chapters:** Chapters 20–30	**Class Periods:** 23	BIO.1C.1 – Model how organelles and systems interact to carry out life functions.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Overview: This unit introduces students to animal structure and physiology with an emphasis on how body systems maintain homeostasis. Topics include tissues, organ systems, immune response, nutrition, circulation, gas exchange, excretion, reproduction, development, hormones, nervous system function, and sensory input. The unit reinforces the relationship between structure and function across systems.		BIO.3C.1 – Model the relationship between DNA, genes, and traits in multicellular systems. BIO.5.1 – Analyze how internal and external factors affect biological systems. BIO.5.4 – Evaluate how disruption to systems affects organism and population health.
Unit 6: Plants: Form and Function **Textbook Chapters:** Chapters 31–33 **Overview:** Students explore how plant structure and function support survival, growth, and reproduction. Topics include plant tissues, roots, stems, leaves, vascular transport, hormonal control, tropisms, and plant reproduction. This unit also emphasizes homeostasis, energy	**Class Periods:** 13	BIO.1C.1 – Model how plant cell structures contribute to homeostasis and growth. BIO.2.2 – Model how photosynthesis captures and transforms solar energy. BIO.5.1 – Use models to analyze plant interactions with biotic and abiotic factors.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
capture, and structural adaptations in plants.		
Unit 7: Ecology **Textbook Chapters:** Chapters 34–38 **Overview:** This final unit focuses on how organisms interact with one another and with their environments. Students investigate energy flow, nutrient cycling, population dynamics, community structure, ecosystems, human impacts, and conservation biology. They apply models to predict ecological change and evaluate the impact of biodiversity loss.	**Class Periods:** 20	BIO.5.1 – Use models to explain how biotic and abiotic factors affect ecosystems. BIO.5.2 – Construct energy pyramids and food webs to explain energy flow. BIO.5.3 – Analyze population dynamics and carrying capacity. BIO.5.4 – Analyze data to predict effects of environmental changes.

Scope & Sequence: Pearson – Introductory Chemistry, © 2024

Course Name: Chemistry (400519) Grades 9-12

**The number of class periods assumes approximately 45-minute class periods. Schedule calculations are based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.*

Note: This scope and sequence is based on a 180-day calendar and includes instructional time for all units aligned to the 2018 Mississippi Chemistry Standards.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 1: Foundations and Scientific Thinking **Textbook Chapters:** 1–3 **Overview:** Students explore the scientific method, measurement, and data analysis in the context of chemistry. They learn dimensional analysis, significant figures, and the role of mathematical reasoning in lab work and chemical calculations.	**Class Periods:** 20	CHE.1.1 – Use dimensional analysis (factor/label) and significant figures to convert units and solve problems. CHE.1.2 – Design and conduct experiments using appropriate measurements, significant figures, graphical analysis to analyze data. CHE.1.3 (Enrichment) – Research information from multiple sources and assess the credibility, accuracy, and bias.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 2: Atoms and Atomic Theory **Textbook** Chapters: 4–5 **Overview:** This unit introduces the atom, including historical models and modern atomic theory. Students explore subatomic particles, isotopes, and how scientists developed our current understanding through experiments.	**Class Periods:** 16	CHE.2.1 – Investigate the historical progression leading to modern atomic theory. CHE.2.2 – Construct models to explain average atomic mass and isotopic abundance. CHE.2.3 – Investigate spectra to explain electrons at discrete energy levels. CHE.2.4 – Evaluate how spectra are used in astronomy and universe formation.
Unit 3: Periodic Table and Electron Arrangement **Textbook Chapters:** 6–7 **Overview:** Students explore the periodic table's structure, atomic properties, and how electrons are organized. They use patterns to predict element behavior and chemical properties.	**Class Periods:** 18	CHE.3.1 – Communicate the organization of the periodic table. CHE.3.2 – Analyze properties of atoms/ions using periodic trends. CHE.3.3 – Identify quantum numbers and electron configurations.
Unit 4: Bonding and Compounds **Textbook Chapters:** 8–9 **Overview:** This unit explores ionic and covalent bonding, molecular	**Class Periods:** 20	CHE.4.1 – Develop models to predict bond type and shape. CHE.4.2 – Depict valence electrons and bonding using Lewis structures.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
shapes, polarity, and bonding theories. Students build models to explain how and why atoms bond.		CHE.4.3 – Predict bond types using electronegativity and periodic position. CHE.4.4 – Predict bond type, compound shape, and polarity. CHE.4.5 – Model hydrocarbons and structural isomerism. CHE.4.6 – Calculate empirical formula and percent composition. CHE.4.7 – Investigate percent composition experimentally. CHE.4.8 – Conduct investigations to determine empirical composition.
Unit 5: Naming Compounds **Textbook Chapters:** 10 **Overview:** Students learn how to name and write formulas for ionic and covalent compounds, acids, and polyatomic ions using standard nomenclature systems.	**Class Periods:** 10	CHE.5.1 – Derive chemical formulas from names and vice versa. CHE.5.2 – Generate formulas of compounds; apply to real-life examples. CHE.5.3 – Name binary, ternary, acids, and compounds using rules.
Unit 6: Chemical Reactions and Stoichiometry **Textbook Chapters:** 11–12 **Overview:** Students classify and predict types of reactions and learn how to balance equations. The unit	**Class Periods:** 24	CHE.6.1 – Predict products of chemical reactions. CHE.6.2 – Conduct investigations on reaction types. CHE.6.3 – Perform stoichiometric calculations.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
builds toward stoichiometric calculations involving moles, mass, and limiting reactants.		CHE.6.4 – Show conservation of mass with math and real-world examples. CHE.6.5 – Use percent error to analyze mass conservation. CHE.6.6 – Analyze limiting reagent and percent yield. CHE.6.7 – Investigate percent yield and limiting reagent. CHE.6.8 (Enrichment) – Use gas stoichiometry in applied situations.
Unit 7: Gases and Gas Laws **Textbook Chapters:** 13 **Overview:** Students apply pressure, volume, and temperature relationships to real gases. They perform calculations using Boyle's, Charles's, and Ideal Gas Laws.	**Class Periods:** 16	CHE.7.1 – Analyze gas behavior using kinetic-molecular theory. CHE.7.3 – Interpret heating curves and phase transitions. CHE.7.4 – Perform gas law calculations. CHE.7.6 – Use ideal gas law in chemical reactions. CHE.7.7 – Confirm conservation of mass in gas reactions.
Unit 8: Solutions and Concentration **Textbook Chapters:** 14 **Overview:** This unit introduces solution formation, concentration (molarity, molality), solubility, and factors that influence dissolving.	**Class Periods:** 20	CHE.8.1 – Calculate solution concentration with molarity and percent mass. CHE.8.2 – Model dissolving on a molecular level. CHE.8.3 – Predict solubility effects from temperature and pressure.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Students model solutions and perform dilution and molarity calculations.		CHE.8.4 – Test conductivity of ionic vs. covalent compounds. CHE.8.5 – Analyze molarity, molality, and dilution problems. CHE.8.6 – Conduct experiments to create specific concentrations. CHE.8.7 – Use solution stoichiometry.
Unit 9: Acids, Bases, Thermochemistry, and Organic Chemistry **Textbook Chapters:** 15–17 (plus select content from 18–19) **Overview:** This final unit provides deep exploration of acid-base chemistry, equilibrium, energy changes in reactions, and the basics of organic compound structure and naming. Students work with pH, thermochemical equations, and simple hydrocarbons to understand real-world chemical processes.	**Class Periods:** 31	CHE.9.1–CHE.9.6 (Acids & Bases) CHE.10.1–CHE.10.4 (Thermochemistry) CHE.11.1–CHE.11.3 (Equilibrium) CHE.12.1–CHE.12.3 (Organic Chemistry)

Scope & Sequence: Pearson – Campbell Biology: Concepts and Connections, © 2021

Course Name: Foundations of Biology (260628) Grades 9-12

**The number of class periods assumes approximately 45-minute class periods. Schedule calculations are based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.*

Note: This scope and sequence is based on a 180-day calendar and includes instructional time for all units aligned to the 2018 Mississippi Foundations of Biology Standards.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 1A: Scientific Contributions **Textbook Chapters: Chapter 1** **Unit Overview:** This unit explores foundational discoveries in biology through landmark experiments and the scientists who conducted them. Students examine how the creation of the microscope, the discovery of cells, DNA, RNA, and natural selection have shaped modern biology. The unit also connects scientific advancement with its impact on society, including medicine, technology, and ethics.	Class Periods: 10	FB.1.1 Identify and communicate the contributions of famous scientists and their experiments that formed fundamental scientific principles. FB.1.2 Trace and model the historical development of scientific ideas and theories.
Unit 1B: Biology in Society **Textbook Chapters: Chapter 4** **Unit Overview:**	Class Periods: 10	FB.1.3 Research, analyze, explain, and communicate how scientific enterprise relates to society and classic inventions.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
This unit explores foundational discoveries in biology through landmark experiments and the scientists who conducted them. Students examine how the creation of the microscope, the discovery of cells, DNA, RNA, and natural selection have shaped modern biology. The unit also connects scientific advancement with its impact on society, including medicine, technology, and ethics.		FB.1.4 Enrichment: Research the influence of society on science and technology (e.g., medical treatments, emerging viruses).
Unit 2A: Atomic Structure and Bonding **Textbook Chapters: Chapters 2, 3** **Unit Overview:** This unit introduces students to atomic structure and chemical bonding as it applies to biology. Students analyze the periodic table, properties of water, and organic molecules essential for life. Emphasis is placed on understanding macromolecules—carbohydrates, proteins, lipids, and nucleic acids—and their functions in living organisms.	Class Periods: 13	FB.2.1 Develop and use atomic models to describe atomic structure. FB.2.2 Obtain and use information about elements to describe the periodic table. FB.2.3 Relate chemical reactivity to position on the periodic table and type of bond. FB.2.4 Analyze and classify solutions as acids, bases, or neutral, and discuss pH importance.
Unit 2B: Properties of Water and Macromolecules **Textbook Chapters: Chapter 5**	Class Periods: 15	FB.2.5 Investigate properties of water in maintaining cell processes.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit Overview: This unit introduces students to atomic structure and chemical bonding as it applies to biology. Students analyze the periodic table, properties of water, and organic molecules essential for life. Emphasis is placed on understanding macromolecules—carbohydrates, proteins, lipids, and nucleic acids—and their functions in living organisms.		FB.2.6 Explain the role of major biomolecules in the survival of living organisms. FB.2.7 Enrichment: Explore biomolecule structure using models.
Unit 3A: Cell Types and Structures **Textbook Chapters: Chapters 4, 5** **Unit Overview:** Students explore cell types and the functions of cellular structures that sustain life. The unit includes comparison of prokaryotic and eukaryotic cells, active and passive transport, and the ATP cycle. Students examine how energy transformations occur through photosynthesis and cellular respiration, and compare the processes of mitosis and meiosis.	Class Periods: 21	FB.3.1 Compare and contrast prokaryotic, eukaryotic, plant, and animal cells. FB.3.2 Use models to investigate structures in living cells. FB.3.3 Compare and contrast active and passive transport; analyze osmosis.
Unit 3B: Cellular Energy and Division **Textbook Chapters: Chapters 6, 8, 16** **Unit Overview:**	Class Periods: 72	FB.3.4 Analyze the relationship between photosynthesis and cellular respiration. FB.3.5 Use models to explain the ATP/ADP energy cycle.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Students explore cell types and the functions of cellular structures that sustain life. The unit includes comparison of prokaryotic and eukaryotic cells, active and passive transport, and the ATP cycle. Students examine how energy transformations occur through photosynthesis and cellular respiration, and compare the processes of mitosis and meiosis.		FB.3.6 Compare and contrast mitosis and meiosis. FB.3.7 Enrichment: Analyze outcomes of failed mitosis or meiosis (e.g., cancer, nondisjunction).
Unit 4A: DNA and RNA **Textbook Chapters: Chapters 3, 4** **Unit Overview:** This unit focuses on how genetic information is stored, transferred, and expressed. Students study the structure and function of DNA and RNA, the relationship among genes, chromosomes, and proteins, and predict inheritance patterns using Punnett squares. The flow of genetic information from nucleic acids to protein synthesis is also emphasized.	Class Periods: 17	FB.4.1 Compare and contrast the structure and function of DNA and RNA.
Unit 4B: Inheritance and Protein Synthesis **Textbook Chapters: Chapters 9, 10** **Unit Overview**:	Class Periods: 17	FB.4.2 Explain relationships among DNA, genes, chromosomes, and proteins. FB.4.3 Use models to predict inheritance patterns using Punnett squares.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
This unit focuses on how genetic information is stored, transferred, and expressed. Students study the structure and function of DNA and RNA, the relationship among genes, chromosomes, and proteins, and predict inheritance patterns using Punnett squares. The flow of genetic information from nucleic acids to protein synthesis is also emphasized.		

Scope & Sequence: Pearson – Human Anatomy & Physiology, © 2025

Course Name: Human Anatomy & Physiology (260751) Grades 9-12

**The number of class periods assumes approximately 45-minute class periods. Schedule calculations are based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.*

Note: This scope and sequence is based on a 180-day calendar and includes instructional time for all units aligned to the 2018 Mississippi Human Anatomy & Physiology Standards.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 1: Introduction to Anatomy and Physiology **Textbook Chapters:** 1–2 **Unit Overview:** This unit introduces students to the language of anatomy and physiology, anatomical terminology, and the levels of structural organization. Students will examine body systems and learn to apply directional terms and anatomical planes.	**Class Periods:** 12	HAP.1.1 Apply appropriate anatomical terminology when explaining the orientation of regions, directions, and body planes or sections. HAP.1.2 Locate organs and their applicable body cavities and systems. HAP.1.3 Investigate the interdependence of the various body systems to each other and to the body as a whole.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 2: Cells and Tissues **Textbook Chapters:** 3–4 **Unit Overview:** Students will explore the structure and function of cells and how they form tissues. Through lab investigations, students will examine epithelial, connective, muscle, and nervous tissue.	**Class Periods:** 12	HAP.2.1 Analyze the characteristics of the four main tissue types: epithelial, connective, muscle, and nervous. HAP.2.2 Construct a model to demonstrate how the structural organization of cells in a tissue relates to the specialized function of that tissue. HAP.2.3 (Enrichment) Use an engineering design process to research and develop medications (i.e., targeted cancer therapy drugs).
Unit 3: The Integumentary System **Textbook Chapters:** 5 **Unit Overview:** This unit focuses on the layers, structures, and functions of the integumentary system. Students investigate mechanisms of temperature regulation and skin-related pathologies.	**Class Periods:** 12	HAP.3.1 Identify structures and explain the functions of the integumentary system. HAP.3.2 Investigate specific mechanisms (e.g., feedback and temperature regulation) through which the skin maintains homeostasis. HAP.3.3 Research and analyze the causes and effects of various pathological conditions (e.g., burns, skin cancer). HAP.3.4 (Enrichment) Use an engineering design process to design effective treatments for skin disorders.
Unit 4: The Skeletal System **Textbook Chapters:** 6–7 **Unit Overview:** Students examine bone structure	**Class Periods:** 13	HAP.4.1 Use models to compare the structure and function of the skeletal system.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
and function, classification, growth, and development. The role of the skeletal system in movement and calcium regulation is emphasized.		HAP.4.2 Identify and classify major bones as part of the appendicular or axial skeleton. HAP.4.3 Identify and classify types of joints and their movement. HAP.4.4 Demonstrate understanding of skeletal system growth and development. HAP.4.5 Explain mechanisms (e.g., Ca2+ regulation) used by the skeletal system to maintain homeostasis. HAP.4.6 Analyze pathological conditions (e.g., osteoporosis, arthritis). HAP.4.7 (Enrichment) Use an engineering design process to model treatments for bone disorders.
Unit 5: The Muscular System **Textbook Chapters:** 8–10 **Unit Overview:** This unit addresses the types of muscle tissue, their structure, contraction mechanisms, and their role in movement and posture. Lab investigations support understanding of physiology and disorders.	**Class Periods:** 13	HAP.5.1 Develop and use models to illustrate muscle structure and actions. HAP.5.2 Describe the structure and function of skeletal muscle fibers. HAP.5.3 Explain the molecular mechanism of muscle contraction. HAP.5.4 Locate major muscles and examine movement. HAP.5.5 Compare anatomy and physiology of three muscle types.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
		HAP.5.6 Conduct investigations on contraction and fatigue. HAP.5.7 Analyze pathological conditions (e.g., muscular dystrophy). HAP.5.8 (Enrichment) Design ergonomic devices to prevent muscle strain.
Unit 6: The Nervous System **Textbook Chapters:** 11–14 **Unit Overview:** Students explore the central and peripheral nervous systems, neurons, brain structures, reflexes, and special senses. The unit connects neuroanatomy to mental health and neurological disorders.	**Class Periods:** 13	HAP.6.1 Describe how the nervous system functions and connects with others. HAP.6.2 Analyze neuron and neuroglia structure and function. HAP.6.3 Discuss structure and function of the brain and spinal cord. HAP.6.4 Compare CNS and PNS, and reflex responses. HAP.6.5 (Enrichment) Test reflex responses under varying conditions. HAP.6.6 Describe the autonomic nervous system. HAP.6.7 Explore special senses (vision, hearing, taste, olfaction). HAP.6.8 Analyze pathological conditions (e.g., Alzheimer's, stroke).

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
		HAP.6.9 (Enrichment) Design preventative devices for neurological disorders.
Unit 7: The Endocrine System **Textbook Chapters:** 16 **Unit Overview:** This unit explores the major endocrine glands, the hormones they secrete, and how those hormones regulate essential functions such as metabolism, growth, stress responses, and blood glucose. Students will examine endocrine feedback mechanisms and common endocrine disorders.	**Class Periods:** 13	HAP.7.1: Illustrate that the endocrine glands secrete hormones that help the body maintain homeostasis through feedback mechanisms. HAP.7.2: Discuss the function of each endocrine gland and the various hormones secreted. HAP.7.3: Model specific mechanisms through which the endocrine system maintains homeostasis. HAP.7.4: Research and analyze the effects of various pathological conditions. HAP.7.5 (Enrichment): Engineering design for endocrine disorder treatments.
Unit 8: The Reproductive System **Textbook Chapters:** 17 **Unit Overview:** This unit covers male and female reproductive anatomy, physiology of gamete production, hormonal regulation, and human development. Students investigate	**Class Periods:** 13	HAP.8.1–8.7: Covers comparative reproductive anatomy, hormonal regulation, embryonic/fetal development, contraceptive methods, and reproductive disorders.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
reproductive health, contraception, and disorders of the reproductive system.		
Unit 9: Blood **Textbook Chapters:** 18 **Unit Overview:** Students explore the components and functions of blood, including red and white blood cells, platelets, and plasma. Topics include blood typing, immunity, and common hematological disorders	**Class Periods:** 10	HAP.9.1–9.4: Structure/function of blood, blood typing and compatibility, blood disorders, and enrichment design tasks.
Unit 10: The Cardiovascular System **Textbook Chapters:** 19–20 **Unit Overview:** This unit introduces the anatomy of the heart, circulatory pathways, blood pressure regulation, and cardiovascular disease. Students investigate how the system maintains homeostasis through vascular and cardiac mechanisms.	**Class Periods:** 13	HAP.10.1–10.7: Modeling the heart, circulation, valves, blood vessels, experimental design, and disorders.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 11: The Lymphatic and Immune System **Textbook Chapters:** 21 **Unit Overview:** This unit examines immune responses and structures including lymph nodes, the spleen, and lymphocytes. Students investigate immunity, leukocyte functions, and related disorders.	**Class Periods:** 10	HAP.11.1–11.7: Covers all aspects of lymphatic structure/function, immunity, and immune-related pathologies.
Unit 12: The Respiratory System **Textbook Chapters:** 22 **Unit Overview:** Students learn about the anatomy of the respiratory tract, mechanisms of breathing, and gas exchange. Emphasis is placed on pulmonary ventilation, environmental impacts, and respiratory health.	**Class Periods:** 10	HAP.12.1–12.6: Breathing mechanics, adaptations, gas exchange, and disorders.
Unit 13: The Digestive System **Textbook Chapters:** 23 **Unit Overview:** This unit explores digestive tract anatomy, chemical and	**Class Periods:** 10	HAP.13.1–13.8: Function of digestive organs, accessory structures, enzyme action, experiments, and disorders.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
mechanical digestion, enzymes, and accessory organs. Students investigate nutrition, hormonal control, and digestive system diseases.		
Unit 14: The Urinary System **Textbooks Chapters:** 24 **Unit Overview:** Students study kidney structure, urine formation, fluid balance, and how the urinary system helps maintain homeostasis. Connections to blood pressure, volume, and pH regulation are emphasized.	**Class Periods:**10	HAP.14.1–14.6: Urinary structure/function, urine formation, homeostatic roles, disorders, and modeling tasks.

Scope & Sequence: Pearson – Essentials of Oceanography, © 2020

Course Name: Marine and Aquatic Science I and II (260625 & 260626) Grades 9-12

**The number of class periods assumes approximately 45-minute class periods. Schedule calculations are based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.*

Note: This scope and sequence is based on a 180-day calendar and includes instructional time for all units aligned to the 2018 Mississippi Marine & Aquatic Science I & II Standards.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Minutes/Periods**	**Referenced Standards**
Unit 1: Introduction to Oceanography **Textbook Chapters:** 1 **Unit Overview:** This unit introduces students to the scope of oceanography, including its subfields, technologies used to study marine environments, and the importance of ocean research. Students will also explore the role of government agencies and environmental policy in marine conservation and biodiversity protection.	**Periods:** 1	**MAQ.1.5:** Research, analyze, and communicate current technology and career opportunities used to collect data on a global scale using CTD, buoy data, or satellites. **MAQ.4.7:** Investigate how local, state, and federal regulatory agencies preserve biodiversity through legislation, research, habitat conservation, and enforcement of policies like the Clean Water Act and Endangered Species Act.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Minutes/Periods**	**Referenced Standards**
Unit 2: Plate Tectonics and Ocean Basins **Textbook Chapters:** 2 **Unit Overview:** This unit explores the geologic processes that shape the ocean floor, including plate tectonics, sea floor spreading, and the formation of oceanic features such as trenches, ridges, and island chains. Students will classify ocean zones and examine how tectonic activity influences aquatic ecosystems.	**Periods:** 13	**MAQ.3.1**: Use geospatial data to analyze and explain geological features in aquatic ecosystems such as abyssal plains, trenches, and seamounts. **MAQ.3.2**: Develop an understanding of plate tectonics to predict geological features and natural events like sea floor spreading and orogenesis. **MAQ.3.3**: Classify zones of the ocean based on proximity to shore (e.g., intertidal, neritic, oceanic) and depth/light availability (e.g., epipelagic, hadopelagic).
Unit 3: Marine Sediments **Textbook Chapters:** 3 **Unit Overview:** Students will investigate the origins, classifications, and significance of marine sediments, including how sediment distribution provides clues about ocean history, climate patterns, and plate movement. This unit builds on knowledge of ocean geology and tectonic processes.	**Periods:** 11	**MAQ.3.1**: Analyze geological features of aquatic ecosystems using geospatial data. **MAQ.3.2**: Predict marine geological events through the lens of plate tectonics, paleomagnetic evidence, and sea floor sediment patterns.
Unit 4: The Marine Environment **Textbook Chapters:** 4	**Periods:** 17	**MAQ.1.1**: Characterize water's physical and chemical properties, including specific heat, cohesion, adhesion, and its

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Minutes/Periods**	**Referenced Standards**
Unit Overview: Students explore the physical and chemical properties of seawater that make it uniquely suited for sustaining life. Topics include salinity, density, dissolved gases, nutrients, and how water's polarity and hydrogen bonding create critical phenomena like cohesion and capillary action. Students will also diagram the water cycle and relate it to freshwater availability and ocean circulation.		role as a universal solvent. **MAQ.1.2**: Describe water's function within biological systems, such as enzymatic reactions and transport mechanisms. **MAQ.1.3**: Diagram the water cycle using digital or physical models, connecting it to freshwater availability. **MAQ.1.4**: Collect, analyze, and communicate water quality data, including dissolved oxygen, salinity, pH, temperature, and nitrogen levels using field and lab equipment.
Unit 5: The Atmosphere and Ocean Circulation **Textbook Chapters:** 5 & 7 **Unit Overview:** This unit investigates the complex interactions between the atmosphere and ocean, including how wind, solar radiation, Earth's rotation, and the Coriolis effect influence surface and deep-water currents. Students examine the role of currents in global climate patterns and ecological health, as well as climate change impacts on ocean systems.	**Periods:** 17	**MAQ.2.3**: Summarize principles of ocean currents such as the Coriolis effect, Ekman spiral, thermohaline circulation, and El Niño/La Niña cycles. **MAQ.2.4**: Analyze scientific models predicting how global and regional climate changes (e.g., warming oceans, changing precipitation) impact Earth systems. **MAQ.2.5**: Distinguish between lentic and lotic freshwater systems based on flow, turnover, and watershed structure.
Unit 6: Waves and Tides **Textbook Chapters:** 8 & 9	**Periods:** 18	**MAQ.2.1**: Identify and describe wave properties (e.g., wavelength, amplitude, wave speed) and the impact of breakers on shorelines and ecosystems.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Minutes/Periods**	**Referenced Standards**
Unit Overview: Students will study the causes, properties, and behavior of waves and tides in both marine and freshwater environments. This includes wave generation, types of breakers, and shoreline interactions. Students will also explore how the moon and sun drive tidal patterns and their effect on ecosystems and coastal development.		**MAQ.2.2**: Survey tidal patterns (diurnal, semidiurnal, mixed, spring, and neap tides) and relate them to lunar phases using graphical analysis.
Unit 7: Coastlines and Ocean Basins **Textbook Chapters:** 10 & 13 **Unit Overview:** This unit explores the geological processes that shape the seafloor and coastlines. Students examine plate tectonics, sea floor spreading, and marine geological features like trenches, mid-ocean ridges, and continental margins. They also classify ocean zones based on light, temperature, and distance from shore and analyze how these features affect marine ecosystems.	**Periods:** 15	**MAQ.3.1**: Use geospatial data to compare geological features of aquatic ecosystems (e.g., trenches, seamounts, continental slopes). **MAQ.3.2**: Apply plate tectonic theory to predict marine geological activity (e.g., sea floor spreading, paleomagnetism). **MAQ.3.3**: Classify ocean zones by distance from shore (e.g., intertidal, neritic) and light/temperature depth zones (e.g., epipelagic, hadopelagic). **MAQ.3.4**: Classify freshwater zones based on flow velocity, depth, and temperature.
Unit 8: Life in the Ocean **Textbook Chapters:** 12 **Unit Overview:** Students are introduced to major aquatic ecosystems and the adaptations of flora	**Periods:** 18	**MAQ.4.1**: Compare aquatic ecosystems (e.g., wetlands, coral reefs, abyss) in terms of unique physical and biological characteristics. **MAQ.4.2**: Identify examples of plants and animals adapted to specific aquatic ecosystems and describe their adaptations.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Minutes/Periods**	**Referenced Standards**
and fauna that live within them. They explore biotic and abiotic interactions, ecosystem structure, food webs, and ecological niches. Emphasis is placed on how physical conditions shape biological communities and how organisms adapt to their environments.		**MAQ.4.3**: Analyze trophic levels and symbiotic relationships by constructing food webs. **MAQ.4.5**: Explore the role of aquatic species diversity in food production, medicine, and aesthetics.
Unit 9: Human Impacts on Aquatic Systems **Textbook Chapters:** 11 & 18 **Unit Overview:** This unit addresses the anthropogenic and natural factors that impact aquatic systems. Students investigate pollution, overfishing, habitat destruction, invasive species, and climate change. They examine the role of local, state, and federal agencies in managing aquatic resources and develop proposed solutions for environmental challenges.	**Periods:** 17	**MAQ.1.6**: Use engineering design to propose solutions for aquatic pollution (e.g., microplastics, eutrophication). **MAQ.4.4**: Analyze human impacts such as erosion, overfishing, pollution, and invasive species. **MAQ.4.6**: Evaluate natural phenomena (e.g., hurricanes, floods, sea level rise) and their effects on aquatic ecosystems. **MAQ.4.7**: Research how regulatory agencies and laws (e.g., Clean Water Act, Endangered Species Act) help conserve aquatic environments. **MAQ.4.8**: Design an environmental action plan that incorporates scientific, legal, and ethical considerations for aquatic ecosystem preservation.
Unit 10: Primary Producers and Energy Flow **Textbook Chapters:** 13 & 14 **Unit Overview:** This unit focuses on the foundational role of primary producers in aquatic ecosystems. Students examine photosynthetic and chemosynthetic organisms, the structure of	**Periods:**13	**MAQ.5.1**: Survey primary producers and their role in aquatic primary productivity across different ecosystems. **MAQ.5.2**: Identify common autotrophs, including Cyanobacteria, protists, algae, and aquatic plants. **MAQ.5.3**: Use graphical tools to demonstrate evolutionary relationships among producers. **MAQ.5.4**: Apply dichotomous keys to classify primary

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Minutes/Periods**	**Referenced Standards**
food webs, and methods used to measure primary productivity. The evolutionary relationships among producers are explored using cladograms and dichotomous keys.		producers. **MAQ.5.5**: Explain photosynthesis and chemosynthesis as energy conversion processes in aquatic systems. **MAQ.5.6 (Enrichment)**: Design improvements for measuring primary productivity using historical and current methods (e.g., light/dark bottle, satellite imaging).
Unit 11: Aquatic Invertebrates **Textbook Chapters:** 15 (selected supplemental content as needed) **Unit Overview:** Students investigate invertebrate taxa found in aquatic ecosystems, from protozoans to echinoderms. Emphasis is placed on morphology, classification, evolutionary relationships, and life cycles. Students conduct dissections and create keys to classify invertebrates and understand ecological roles.	**Periods:** 14	**MAQ.6.1**: Characterize invertebrate taxa including Protozoa, Porifera, Mollusca, Arthropoda, and Echinodermata. **MAQ.6.2**: Use cladograms and phylogenetic trees to identify shared and derived traits. **MAQ.6.3**: Construct dichotomous classification keys for identifying aquatic invertebrates. **MAQ.6.4**: Compare body plans (symmetry, coelom types). **MAQ.6.5**: Explain life cycles of aquatic invertebrates (e.g., cnidarian alternation, arthropod metamorphosis). **MAQ.6.6**: Dissect and analyze internal and external anatomy of representative species. **MAQ.6.7**: Assess ecological roles through anatomical and physiological adaptations. **MAQ.6.8 (Enrichment)**: Design a hypothetical organism adapted to a specific aquatic niche using engineering design.
Unit 12: Aquatic Vertebrates **Textbook Chapters:** 16 (selected supplemental content as needed) **Unit Overview:** This unit explores vertebrate diversity in aquatic environments. Students study members of Phylum Chordata and their	**Periods:** 14	**MAQ.7.1**: Classify aquatic vertebrates in Hemichordata, Urochordata, Cephalochordata, and Vertebrata (e.g., fish, amphibians, mammals). **MAQ.7.2**: Develop cladograms to show evolutionary relationships of aquatic vertebrates. **MAQ.7.3**: Use dichotomous keys for identifying aquatic vertebrates.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Minutes/Periods**	**Referenced Standards**
adaptations for survival. Comparative anatomy, classification, and evolutionary relationships are emphasized, along with dissection, ecological role assessment, and developmental life cycles.		**MAQ.7.4**: Compare life cycles, including amphibians, reptiles, and mammals. **MAQ.7.5**: Dissect representative aquatic vertebrates and analyze their anatomical adaptations. **MAQ.7.6**: Evaluate how vertebrate traits relate to ecological roles in aquatic systems. **MAQ.7.7 (Enrichment)**: Design a custom vertebrate species suited to a niche, incorporating anatomical, ecological, and physiological considerations.
Unit 13: Course Review and Capstone Synthesis **Chapters:** Comprehensive (Chapters 1–16) **Unit Overview:** In this final unit, students synthesize key concepts from both Marine and Aquatic Science I and II. They will review essential physical, chemical, geological, and biological oceanographic principles, reinforce major lab skills, and reflect on human-environment interactions. Students will complete a culminating project that incorporates scientific research, environmental impact evaluation, and proposed solutions based on current marine science challenges.	**Periods: 7**	**Standards Emphasized:** This unit integrates all major themes and scientific practices across the course, with emphasis on: • **Scientific inquiry and engineering design practices**, including the development of environmental action plans, data analysis, and modeling. • **Cumulative understanding** of water properties, fluid dynamics, ecosystems, biodiversity, primary productivity, geological processes, and human impacts. • **Communication and collaboration** through presentations, written reports, and peer review of proposed solutions to real-world marine science issues. This capstone unit ensures students can articulate the interconnectedness of marine systems, apply standards-based knowledge in real-world contexts, and demonstrate readiness for advanced study or careers in marine science.

Scope & Sequence: Pearson – Conceptual Integrated Science, © 2020

Course Name: Physical Science (400700) Grades 9-12

**The number of class periods assumes approximately 45-minute class periods. Schedule calculations are based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.*

Note: This scope and sequence is based on a 180-day calendar and includes instructional time for all units aligned to the 2018 Mississippi Physical Science Standards.

This is a suggested scope and sequence for the course content.

Unit and Chapters	Periods	Referenced Standards
Unit 1: Describing Motion and Newton's Laws Textbook Chapters: Chapter 2 and Chapter 3 Unit Overview: This unit explores the concepts of speed, velocity, acceleration, and Newton's Laws of Motion. Students learn to describe motion using graphs and equations, and investigate the effects of forces on motion through experiments.	Class Periods: 23	PHS.5.1 Research Newton's scientific contributions and use models to communicate Newton's principles. PHS.5.2 Design and conduct investigations to study motion using displacement, time, velocity, and acceleration. PHS.5.3 Interpret data to determine average speed using proper units. PHS.5.4 Use mathematics to explore the relationship between force, mass, and acceleration (F=ma). PHS.5.5 Use simulations or probes to explore F=ma.

Unit 2: Momentum, Work, and Energy Textbook Chapters: Chapter 4 Unit Overview: Students examine concepts of momentum, conservation of momentum, work, power, kinetic and potential energy, and energy transfer. Mathematical models help relate energy principles to motion and machine efficiency.	Class Periods: 21	PHS.5.6 Demonstrate conservation of momentum through models and engineering design. PHS.5.7 Use computational representations to explore the relationship between force, work, and energy. PHS.5.8 Investigate the efficiency of machines and their societal impact.
Unit 3: Heat and Thermal Energy Textbook Chapters: Chapter 6 Unit Overview: This unit introduces students to the kinetic theory of matter, heat, and temperature. Students explore thermal energy transfer through conduction, convection, and radiation.	Class Periods: 16	PHS.1.1 Describe particle theory of matter for solids, liquids, and gases using contextual evidence. PHS.8.3 Relate thermal energy transfer to real-world applications (conduction, convection, radiation).
Unit 4: Atomic Structure and the Periodic Table Textbook Chapters: Chapter 9 Unit Overview: This unit focuses on the structure of atoms and the historical development of atomic theory. Students learn about subatomic particles and how atomic models have evolved.	Class Periods: 16	PHS.2.1 Model historical and modern atomic theories including Dalton, Thomson, Rutherford, Bohr. PHS.3.1 Analyze the periodic table organization and interpret properties based on groupings.

Unit 5: Chemical Bonding and Reactions Textbook Chapters: Chapters 11–13 Unit Overview: Students explore the differences between physical and chemical changes, types of chemical bonds, naming compounds, and balancing equations. Nuclear reactions are introduced with a focus on applications and energy considerations.	Class Periods: 25	PHS.3.2 Investigate compound formation through ionic and covalent bonding. PHS.3.3 Name binary compounds and write formulas using conventions. PHS.3.4 Name common acids and lab compounds using conventions. PHS.4.1 Investigate physical and chemical changes. PHS.4.3 Balance chemical equations. PHS.4.5 Explore nuclear reactions such as fission and fusion. PHS.4.6 Debate nuclear energy's benefits and risks.
Unit 6: Waves, Sound, and Light Textbook Chapters: Chapter 8 Unit Overview: Students examine wave types, properties, and behaviors, including sound and light waves. They investigate real-world applications and model wave interactions.	Class Periods: 18	PHS.6.1 Describe mechanical wave properties (wavelength, amplitude, frequency, speed). PHS.6.2 Analyze transverse and longitudinal wave examples. PHS.6.3 Model energy transfer via wave motion.
Unit 7: The Atomic Nucleus and Radioactivity Textbook Chapters: Chapter 10 Unit Overview: This unit explores radioactivity, half-life, and the strong nuclear force. Students evaluate the role of nuclear reactions in science and society.	Class Periods: 17	PHS.4.5 Research modern nuclear reactions and their scientific significance. PHS.4.6 Evaluate pros and cons of nuclear energy.

Unit 8: Electricity and Magnetism Textbook Chapters: Chapter 7 Unit Overview: Students explore electric charges, current, circuits, and magnetic fields. They investigate how electricity and magnetism are used in practical and technological systems.	Class Periods: 16	PHS.9.1 Investigate static and current electricity; model magnetism and electric currents. PHS.9.2 Distinguish among magnets, motors, and generators in modern industry.
Unit 9: Nature of Matter, Measurement, and Review Textbook Chapters: Chapter 1 (partial), Chapter 2 (partial), Cumulative Review Unit Overview: Students learn scientific measurement techniques and fundamental definitions of matter. The unit includes final review activities and assessments to reinforce key physical science concepts.	Class Periods: 23	PHS.1.4 Conduct investigations to measure mass, volume, and temperature. PHS.5.3 Interpret data and create graphs related to motion. PHS.7.4 Provide evidence of energy conservation.

Scope & Sequence: Pearson – Conceptual Physics, © 2022

Course Name: Physics (400820) Grades 9-12

**The number of class periods assumes approximately 45-minute class periods. Schedule calculations are based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.*

Note: This scope and sequence is based on a 180-day calendar and includes instructional time for all units aligned to the 2018 Mississippi Physics Standards.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 1: Linear Motion Textbook Chapters: Chapter 3: Linear Motion Unit Overview: This unit introduces students to the core concepts of linear motion, including displacement, velocity, acceleration, and free fall. Students will explore motion through real-world investigations and computational analysis using kinematic equations.	Class Periods: 21	PHY.1.1 Investigate and analyze evidence gained through observation or experimental design regarding the one-dimensional (1-D) motion of objects. Design and conduct experiments to generate and interpret graphical evidence of distance, velocity, and acceleration through motion. PHY.1.2 Interpret and predict 1-D motion based on displacement vs. time, velocity vs. time, or acceleration vs. time graphs. PHY.1.3 Use mathematical and computational analysis to solve problems using kinematic equations. PHY.1.5 Differentiate and give examples of motion concepts such as distance-displacement, speed-velocity, and acceleration.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit 2: Newton's Laws of Motion Textbook Chapters: Chapters 2, 4, and 8 Unit Overview: This unit explores Newton's first, second, and third laws of motion, the forces that affect motion, and the principles of circular and rotational motion. Students use free-body diagrams, vector analysis, and simulations to investigate dynamics.	Class Periods: 26	PHY.2.1 Identify forces acting on a system by applying Newton's laws mathematically and graphically. PHY.2.2 Use models such as free-body diagrams to explain and predict motion, including circular motion. PHY.2.3 Use mathematical and graphical techniques to solve vector problems and find net forces. PHY.2.4 Use vectors and mathematical analysis to explore 2D motion of objects. PHY.2.6 Use mathematical and computational analysis to explore forces (e.g., friction, normal, tension).
Unit 3: Momentum and Impulse Textbook Chapters: Chapter 6: Momentum Unit Overview: Students analyze momentum, impulse, and conservation laws through real-world examples and mathematical models. Concepts of collisions and applications of conservation of momentum are emphasized.	Class Periods: 15	PHY.3.2 Use mathematical and computational analysis to explore conservation of momentum and impulse. PHY.3.4 Design and conduct investigations to compare conservation of momentum and conservation of kinetic energy in elastic and inelastic collisions.
Unit 4: Work, Energy, and Power Textbook Chapters: Chapter 7: Energy	Class Periods: 18	PHY.3.1 Use mathematical and computational analysis to analyze the concept of work, energy, and power and apply conservation of energy.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
Unit Overview: Students develop an understanding of work, kinetic and potential energy, power, and the conservation of energy in mechanical systems. Investigations focus on transformations between energy forms and calculations of work and efficiency.		PHY.3.3 Through real-world applications, draw conclusions about mechanical potential and kinetic energy using simulations or labs.
Unit 5: Waves and Sound Textbook Chapters: Chapters 19–20 Unit Overview: This unit explores wave motion, sound waves, harmonic motion, wave speed, reflection, refraction, and resonance. Students conduct experiments and apply mathematical analysis to wave behavior.	Class Periods: 21	PHY.4.1 Analyze the characteristics and properties of simple harmonic motions, sound, and light. PHY.4.2 Describe and model the characteristics and properties of mechanical waves. PHY.4.3 Use mathematical and computational analysis to explore wave characteristics. PHY.4.5 Design, investigate, and collect data on standing waves and waves in specific media.
Unit 6: Light and Optics Textbook Chapters: Chapters 26, 28, 30 Unit Overview: Students explore properties of light including reflection, refraction, electromagnetic spectrum, emission and absorption spectra.	Class Periods: 15	PHY.4.7 Explain the laws of reflection and refraction, and apply Snell's Law to describe angles of incidence and refraction. PHY.4.8 Use ray diagrams and the thin lens equations to solve real-world problems. PHY.4.9 Research the different bands of electromagnetic radiation, including characteristics, properties, and differences.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
The unit includes lab-based optics experiments and digital modeling.		PHY.4.10 Enrichment: Research how absorption and emission spectra are used in astronomy.
Unit 7: Electricity and Magnetism Textbook Chapters: Chapters 22–25 Unit Overview: Students explore electrical charges, current, resistance, Ohm's law, electric circuits, magnetism, and electromagnetic induction. Investigations and simulations support understanding of energy transformation and electromotive force.	Class Periods: 21	PHY.5.1 Analyze and explain electricity and the relationship between electricity and magnetism. PHY.5.2 Explore static charge and how it is generated. PHY.5.3 Analyze problems dealing with electric field, potential, current, voltage, and resistance using Ohm's law. PHY.5.5 Investigate magnetic poles and magnetic fields using simulations or lab tools.
Unit 8: Thermodynamics Textbook Chapters: Chapters 15, 18 Unit Overview: Students examine thermal energy transfer, heat capacity, specific heat, and the laws of thermodynamics. Lab activities explore real-world applications of thermal equilibrium and energy flow.	Class Periods: 18	PHY.3.5 Investigate and summarize the principles of thermodynamics related to heat transfer. PHY.3.6 Enrichment: Explore how temperature and thermal energy relate to molecular motion. PHY.3.7 Enrichment: Analyze problems involving specific heat and heat capacity. PHY.3.8 Enrichment: Compare the first and second laws of thermodynamics using real-world examples.
Unit 9: Nuclear Energy Textbook Chapters: Chapters 11, 33, 34 Unit Overview:	Class Periods: 19	PHY.6.1 Analyze and explain the concepts of nuclear physics. PHY.6.2 Explore mass and atomic numbers of isotopes.

This is a suggested scope and sequence for the course content.		
Unit/Chapters	**Periods**	**Referenced Standards**
This unit introduces nuclear physics concepts such as radioactive decay, fission, fusion, half-life, and isotopes. Students investigate conservation of mass and charge in nuclear processes.		PHY.6.3 Investigate conservation of mass and charge by writing and balancing nuclear decay equations. PHY.6.4 Simulate nuclear decay and determine half-life of radioactive isotopes.

Standards Correlations

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
BIO.1 Cells as a System	Biologists have determined that organisms share unique characteristics that differentiate them from non-living things. Organisms range from very simple to extremely complex.	BIO.1A Students will demonstrate an understanding of the characteristics of life and biological organization.	BIO.1A.1 Develop criteria to differentiate between living and non-living things.	NA
			BIO.1A.2 Describe the tenets of cell theory and the contributions of Schwann, Hooke, Schleiden, and Virchow.	Chapter 4: A Tour of the Cell 4.0 Microscopes reveal a startling new view of life Introduction to the Cell Page 60 4.1 Microscopes reveal the world of the cell Page 61
			BIO.1A.3 Using specific examples, explain how cells can be organized into complex tissues, organs, and organ systems in multicellular organisms.	Chapter 1: Biology: Exploring Life 1.3 VISUALIZING THE CONCEPT In life's hierarchy of organization, new properties emerge at each level Page 4

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 20: Unifying Concepts of Animal Structure and Function 20.2 Structure fits function at all levels of organization in the animal body Topic Overview Video: Anatomy and Physiology Page 426 20.3 Tissues are groups of cells with a common structure and function Page 427
			BIO.1A.4 Use evidence from current scientific literature to support whether a virus is living or non-living.	Chapter 10: Molecular Biology of the Gene The Genetics of Viruses and Bacteria 10.17 Viral DNA may become part of the host chromosome Page 217 10.18 Many viruses cause disease in animals and plants Page 218

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				10.19 Emerging viruses threaten human health Page 219
	Organisms are composed of four primary macromolecules: carbohydrates, lipids, proteins, and nucleic acids. Metabolism is the sum of all chemical reactions between molecules within cells. Cells continuously utilize materials obtained from the environment and the breakdown of other macromolecules to synthesize their own large macromolecules for cellular structures and functions. These metabolic reactions	BIO.1B Students will analyze the structure and function of the macromolecules that make up cells.	BIO.1B.1 Develop and use models to compare and contrast the structure and function of carbohydrates, lipids, proteins, and nucleic acids (DNA and RNA) in organisms.	Chapter 3: The Molecules of Cells 3.2 A few chemical groups are key to the functioning of biological molecules Page 42 3.3 Cells make large molecules from a limited set of small molecules Page 43 Carbohydrates 3.4 Monosaccharides are the simplest carbohydrates Page 44 3.5 Two monosaccharides are linked to form a disaccharide Page 45

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	require enzymes for catalysis.			3.7 Polysaccharides are long chains of sugar units Page 47 3.8 Fats are lipids that are mostly energy-storage molecules Page 48 3.10 Phospholipids and steroids are important lipids with a variety of functions Page 50 3.12 Proteins have a wide range of functions and structures Page 52 3.13 Proteins are made from amino acids linked by peptide bonds Page 52

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				3.14 VISUALIZING THE CONCEPT A protein's functional shape results from four levels of structure Page 54 Nucleic Acids 3.15 The nucleic acids DNA and RNA are information-rich polymers of nucleotides Page 55
			BIO.1B.2 Design and conduct an experiment to determine how enzymes react given various environmental conditions (i.e., pH, temperature, and concentration). Analyze, interpret, graph, and present data to explain how those changing conditions affect the enzyme activity and the rate of the reactions that take place in biological organisms.	Chapter 5: The Working Cell How Enzymes Function 5.13 Enzymes speed up the cell's chemical reactions by lowering energy barriers 3.16 Lactose tolerance is a recent event in human evolution 3.16 Lactose tolerance is a recent event in human evolution

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 56
	Cells are the basic units of all organisms, both prokaryotes and eukaryotes. Prokaryotic and eukaryotic cells differ in key structural features, but both can perform all functions necessary for life.	BIO.1C Students will relate the diversity of organelles to a variety of specialized cellular functions.	BIO.1C.1 Develop and use models to explore how specialized structures within cells (e.g., nucleus, cytoskeleton, endoplasmic reticulum, ribosomes, Golgi apparatus, lysosomes, mitochondria, chloroplast, centrosomes, and vacuoles) interact to carry out the functions necessary for organism survival.	Chapter 4: A Tour of the Cell 4.5 The nucleus contains the cell's genetic instructions Page 65 to 4.21 Cell walls enclose and support plant cells Page 81 4.22 Review: Eukaryotic cell structures can be grouped on the basis of four main functions Page 82
			BIO.1C.2 Investigate to compare and contrast prokaryotic cells and eukaryotic cells, and plant, animal, and fungal cells.	Chapter 4: A Tour of the Cell 4.3 Prokaryotic cells are structurally simpler than eukaryotic cells Page 63 4.4 Eukaryotic cells are partitioned into functional compartments Page 64

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				4.19 The extracellular matrix of animal cells functions in support and regulation Page 79 4.20 Three types of cell junctions are found in animal tissues Page 80 4.21 Cell walls enclose and support plant cells Page 81 Chapter 16: Microbial Life: Prokaryotes and Protists Prokaryotes 16.1 Prokaryotes are diverse and widespread Page 337 16.12 Protists are an extremely diverse assortment of eukaryotes

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 348 Chapter 17: The Evolution of Plant and Fungal Diversity Figure 17.12A Mycelium on fallen conifer needles Page 371 Figure 17.12B Fungal reproductive and feeding structures Page 371
			BIO.1C.3 Contrast the structure of viruses with that of cells, and explain why viruses must use living cells to reproduce.	Chapter 10: Molecular Biology of the Gene The Genetics of Viruses and Bacteria 10.17 Viral DNA may become part of the host chromosome Page 217 10.18 Many viruses cause disease in animals and plants Page 218

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				10.19 Emerging viruses threaten human health Page 219 Chapter 24: The Immune System 24.14 HIV destroys helper T cells, compromising the body's defenses Page 517
	The structure of the cell membrane allows it to be a selectively permeable barrier and maintain homeostasis. Substances that enter or exit the cell must do so via the cell membrane. This transport across the membrane may occur through a variety of mechanisms, including simple diffusion,	BIO.1D Students will describe the structure of the cell membrane and analyze how the structure is related to its primary function of regulating transport in and out of cells to maintain homeostasis.	BIO.1D.1 Plan and conduct investigations to prove that the cell membrane is a semi-permeable, allowing it to maintain homeostasis with its environment through active and passive transport processes.	Chapter 5: The Working Cell 5.1 VISUALIZING THE CONCEPT Membranes are fluid mosaics of lipids and proteins with many functions Page 87 5.3 Passive transport is diffusion across a membrane with no energy investment Page 89

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	facilitated diffusion, osmosis, and active transport.			5.4 Osmosis is the diffusion of water across a membrane Page 90 5.5 Water balance between cells and their surroundings is crucial to organisms Page 91 5.6 Transport proteins can facilitate diffusion across membranes Page 92 5.8 Cells expend energy in the active transport of a solute Page 94 5.9 Exocytosis and endocytosis transport large molecules across membranes Page 95
			BIO.1D.2 Develop and use models to explain how the cell deals with imbalances of solute concentration	Chapter 5: The Working Cell 5.5 Water balance between cells and their surroundings is crucial to organisms

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			across the cell membrane (i.e., hypertonic, hypotonic, and isotonic conditions, sodium/potassium pump).	Page 91 Figure 5.5 How animal and plant cells react to changes in tonicity (deeping shades of blue reflect increasing concentrations of solutes in the surrounding solutions) Page 91 Checkpoint 5.5 Explain the function of the contractile vacuoles in a freshwater Paramecium (shown in Figure 4.11A) in terms of what you have just learned about water balance in cells. Page 91 5.8 Cells expend energy in the active transport of a solute Page 94

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	Cells grow and reproduce through a regulated cell cycle. Within multicellular organisms, cells repeatedly divide for repair, replacement, and growth. Likewise, an embryo begins as a single cell that reproduces to form a complex, multicellular organism through the processes of cell division and differentiation.	BIO.1E Students will develop and use models to explain the role of the cell cycle during growth, development, and maintenance in multicellular organisms.	BIO.1E.1 Construct models to explain how the processes of cell division and cell differentiation produce and maintain complex multicellular organisms.	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.1 Cell division plays many important roles in the lives of organisms Page 147 Checkpoint 8.1 What function does cell division play in an amoeba (a single-celled protist)? What functions does it play in your body? Page 147 Figure 8.2A Binary fission of a prokaryotic cell Page 147 8.4 The cell cycle includes growth and division phases Page 150 8.5 Cell division is a continuum of dynamic changes

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 151 Figure 8.5 The stages of cell division by mitosis Page 151 BioFlix: Mitosis Page 151 8.13 Meiosis reduces the chromosome number from diploid to haploid Page 159 Chapter 27: Reproduction and Embryonic Development 27.1 Asexual reproduction results in the generation of genetically identical offspring Page 555 27.2 Sexual reproduction results in the generation of genetically unique offspring Page 556

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				27.5 The formation of sperm and egg cells requires meiosis Page 559 27.9 Fertilization results in a zygote and triggers embryonic development Page 563 27.12 Organs start to form after gastrulation Page 566 27.13 Multiple processes give form to the developing animal Page 567
			BIO.1E.2 Identify and describe the changes that occur in a cell during replication. Explore problems that might occur if the cell does not progress through the cycle correctly (cancer).	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.3 The large, complex chromosomes of eukaryotes duplicate with each cell division Page 149

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				8.9 Growing out of control, cancer cells produce malignant tumors Page 155 8.18 Accidents during meiosis can alter chromosome number Page 164 Checkpoint 8.18 Explain how nondisjunction could result in a diploid gamete. Page 164 8.20 An extra copy of chromosome 21 causes Down syndrome Page 166
			BIO.1E.3 Relate the processes of cellular reproduction to asexual reproduction in simple organisms (i.e., budding, vegetative propagation, regeneration, binary fission). Explain why the DNA of the	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.1 Cell division plays many important roles in the lives of organisms

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			daughter cells is the same as the parent cell.	Page 147 Checkpoint 8.1 What function does cell division play in an amoeba (a single-celled protist)? What functions does it play in your body? Page 147 Figure 8.2A Binary fission of a prokaryotic cell Page 147 Chapter 27: Reproduction and Embryonic Development 27.1 Asexual reproduction results in the generation of genetically identical offspring Page 555
			BIO.1E.4 Enrichment: Use an engineering design process to investigate the role of stem cells in regeneration and asexual reproduction, then develop	Chapter 27: Reproduction and Embryonic Development 27.10 Cleavage produces a blastula from the zygote Page 564

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			applications of stem cell research to solve human medical conditions.*	Chapter 11: How Genes Are Controlled 11.14 Therapeutic cloning can produce stem cells with great medical potential Page 241 Figure 11.14 Therapeutic cloning using stem cells Page 241
BIO.2 Energy Transfer	Organisms require energy to perform life functions. Cells are transformers of energy, continuously utilizing a complex sequence of reactions in which energy is transferred from one form to another, for example, from light energy to chemical energy to kinetic energy. Emphasis is on	BIO.2 Students will explain that cells transform energy through the processes of photosynthesis and cellular respiration to drive cellular functions.	BIO.2.1 Use models to demonstrate that ATP and ADP are cycled within a cell as a means to transfer energy.	Chapter 5: The Working Cell 5.10 Cells transform energy and matter as they perform work Page 96 Figure 5.10 An illustration of the two laws of thermodynamics: transformation of energy and increase in entropy Page 96

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	illustrating the inputs and outputs of matter and the transfer and transformation of energy in photosynthesis and cellular respiration. Assessment is limited to identification of the phases (i.e., glycolysis, citric acid cycle, and electron transport chain) in cellular respiration as well as light and light-independent reactions of photosynthesis and does not include specific biochemical reactions within the phases.			5.12 ATP drives cellular work by coupling exergonic and endergonic reactions Page 98 Figure 5.12A The hydrolysis of ATP yielding ADP, a phosphate group, and energy Page 98 Figure 5.12B How ATP powers cellular work Page 98 Figure 5.12C The ATP cycle Page 98 Chapter 6: How Cells Harvest Chemical Energy 6.3 Cellular respiration banks energy in ATP molecules Page 109 Figure 6.3 Summary equation for cellular respiration

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 109
			BIO.2.2 Develop models of the major reactants and products of photosynthesis to demonstrate the transformation of light energy into stored chemical energy in cells. Emphasize the chemical processes in which bonds are broken and energy is released, and new bonds are formed and energy is stored.	Chapter 7: Photosynthesis: Using Light to Make Food 7.4 Photosynthesis is a redox process Page 131 Figure 7.4 The redox reactions of photosynthesis Page 131 7.5 Photosynthesis occurs in two stages, which are linked by ATP and NADPH Page 132 Figure 7.5A The summary equation of photosynthesis Page 132 Figure 7.5B An overview of the two stages of photosynthesis in a chloroplast Page 132 BioFlix: Photosynthesis

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 132 7.7 Photosystems capture solar energy Page 134 Figure 7.7B A photosystem harvesting light energy and an excited electron being passed to the primary electron acceptor Page 134 7.8 Two photosystems connected by an electron transport chain convert light energy to the chemical energy of ATP and NADPH Page 135 Figure 7.8 A mechanical analogy of the light reactions Page 135

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				7.9 VISUALIZING THE CONCEPT The light reactions take place within the thylakoid membranes Page 136 The Calvin Cycle: Reducing CO2 to Sugar 7.10 ATP and NADPH power sugar synthesis in the Calvin cycle Page 137 Figure 7.10 Details of the Calvin cycle, which takes place in the stroma of a chloroplast Page 137
			BIO.2.3 Develop models of the major reactants and products of cellular respiration (aerobic and anaerobic) to demonstrate the transformation of the chemical energy stored in food to the available	Chapter 6: How Cells Harvest Chemical Energy Cellular Respiration: Aerobic Harvesting of Energy Page 107

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			energy of ATP. Emphasize the chemical processes in which bonds are broken and energy is released, and new bonds are formed and energy is stored.	6.2 Breathing supplies O2 for use in cellular respiration and removes CO2 Page 108 6.3 Cellular respiration banks energy in ATP molecules Page 109 Figure 6.3 Summary equation for cellular respiration Page 109 6.4 The human body uses energy from ATP for all its activities Page 110 6.6 Overview: Cellular respiration occurs in three main stages Page 112 to 6.11 VISUALIZING THE CONCEPT Stage 3: Most ATP production occurs by oxidative phosphorylation

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 117 6.14 Fermentation enables cells to produce ATP without oxygen Page 120
			BIO.2.4 Conduct scientific investigations or computer simulations to compare aerobic and anaerobic cellular respiration in plants and animals, using real world examples.	Chapter 6: How Cells Harvest Chemical Energy 6.13 Review: Each molecule of glucose yields many molecules of ATP Page 119 Figure 6.13 An estimated tally of the ATP produced per molecule of glucose by substrate-level and oxidative phosphorylation in cellular respiration Page 119 6.14 Fermentation enables cells to produce ATP without oxygen Page 120

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 6.14A Lactic acid fermentation. NAD+ is regenerated as pyruvate is reduced to lactate. Page 120
			BIO.2.5 Enrichment: Investigate variables (e.g., nutrient availability, temperature) that affect anaerobic respiration and current real-world applications of fermentation.	Chapter 6: How Cells Harvest Chemical Energy 6.14 Fermentation enables cells to produce ATP without oxygen Page 120 Figure 6.14A Lactic acid fermentation. NAD+ is regenerated as pyruvate is reduced to lactate. Page 120 Alcohol Fermentation Page 120 Types of Anaerobes Page 120

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			BIO.2.6 Enrichment: Use an engineering design process to manipulate factors involved in fermentation to optimize energy production.*	Chapter 6: How Cells Harvest Chemical Energy 6.14 Fermentation enables cells to produce ATP without oxygen Page 120 Figure 6.14A Lactic acid fermentation. NAD+ is regenerated as pyruvate is reduced to lactate. Page 120 Alcohol Fermentation Page 120 Types of Anaerobes Page 120 Checkpoint 6.14 A glucose-fed yeast cell is moved from an aerobic environment to an anaerobic one. For the cell to continue generating ATP at the same rate, how would its

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				rate of glucose consumption need to change? Page 120
BIO.3 Reproduction and Heredity	Somatic cells contain homologous pairs of chromosomes, one member of each pair obtained from each parent, that form a diploid set of chromosomes in each cell. These chromosomes are similar in genetic information but may contain different alleles of these genes. For sexual reproduction, an offspring must inherit a haploid set from each parent. Haploid gametes are formed by meiosis, a specialized cell division in which the chromosome number is reduced by half.	BIO.3A Students will develop and use models to explain the role of meiosis in the production of haploid gametes required for sexual reproduction.	BIO.3A.1 Model sex cell formation (meiosis) and combination (fertilization) to demonstrate the maintenance of chromosome number through each generation in sexually reproducing populations. Explain why the DNA of the daughter cells is different from the DNA of the parent cell.	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.13 Meiosis reduces the chromosome number from diploid to haploid Page 159 Figure 8.13 The stages of meiosis Page 159 BioFlix: Meiosis Page 159 8.15 Independent orientation of chromosomes in meiosis and random fertilization lead to varied offspring Page 161

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	During meiosis, members of a homologous pair may exchange information and then are randomly sorted into gametes resulting in genetic variation in sex cells.		BIO.3A.2 Compare and contrast mitosis and meiosis in terms of reproduction.	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.1 Cell division plays many important roles in the lives of organisms Page 147 8.2 Prokaryotes reproduce by binary fission Page 148 Checkpoint 8.2 Why is binary fission classified as asexual reproduction? Page 148 8.14 VISUALIZING THE CONCEPT Mitosis and meiosis have important similarities and differences Page 160 8.15 Independent orientation of chromosomes in meiosis

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				and random fertilization lead to varied offspring Page 161
			BIO.3A.3 Investigate chromosomal abnormalities (e.g., Down syndrome, Turner's syndrome, and Klinefelter syndrome) that might arise from errors in meiosis (nondisjunction) and how these abnormalities are identified (karyotypes).	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.18 Accidents during meiosis can alter chromosome number Page 164 Figure 8.18 Nondisjunction in meiosis I and meiosis II Page 164 8.19 A karyotype is a photographic inventory of an individual's chromosomes Page 165 8.20 An extra copy of chromosome 21 causes Down syndrome Page 166

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				8.23 Alterations of chromosome structure can cause birth defects and cancer Page 169
	Offspring inherit DNA from their parents. The genes contained in the DNA (genotype) determine the traits expressed in the offspring's phenotype. Alleles of a gene may demonstrate various patterns of inheritance. These patterns of inheritance may be followed through multiple generations within families.	BIO.3B Students will analyze and interpret data collected from probability calculations to explain the variation of expressed traits within a population.	BIO.3B.1 Demonstrate Mendel's law of dominance and segregation using mathematics to predict phenotypic and genotypic ratios by constructing Punnett squares with both homozygous and heterozygous allele pairs.	Chapter 9: Patterns of Inheritance 9.3 Mendel's law of segregation describes the inheritance of a single character Page 176 Figure 9.3A A cross that tracks one character (flower color) Page 176 Figure 9.3B An explanation of the crosses in Figure 9.3A Page 176 9.4 Homologous chromosomes bear the alleles for each character Page 177

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 9.4 Three gene loci on homologous chromosomes Page 177 9.6 Geneticists can use a testcross to determine unknown genotypes Page 179 9.7 Mendel's laws reflect the rules of probability Page 180 9.9 Many inherited traits in humans are controlled by a single gene Page 182 Figure 9.9A Examples of single-gene inherited traits in humans Page 182 Figure 9.9B Offspring produced by parents who are

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				both carriers for albinism, a recessive disorder Page 182
			BIO.3B.2 Illustrate Mendel's law of independent assortment using Punnett squares and/or the product rule of probability to analyze monohybrid crosses.	Chapter 9: Patterns of Inheritance 9.5 The law of independent assortment is revealed by tracking two characters at once Page 178 Figure 9.5ATwo hypotheses for segregation in a dihybrid cross Page 178 Figure 9.5B Independent assortment of two genes in Labrador retrievers Page 178 9.7 Mendel's laws reflect the rules of probability Page 180

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 9.7 Segregation and fertilization as chance events Page 180
			BIO.3B.3 Investigate traits that follow non-Mendelian inheritance patterns (e.g., incomplete dominance, codominance, multiple alleles in human blood types, and sex-linkage).	Chapter 9: Patterns of Inheritance 9.11 Incomplete dominance results in intermediate phenotypes Page 184 9.12 Many genes have more than two alleles that may be codominant Page 185 Figure 9.12 Multiple alleles for the ABO blood groups Page 185 9.21 Sex-linked genes exhibit a unique pattern of inheritance Page 194 Figure 9.21A Fruit fly eye color determined by sex-linked gene Page 194

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 9.21C A heterozygous female crossed with a red-eyed male Page 194
			BIO.3B.4 Analyze and interpret data (e.g., pedigrees, family, and population studies) regarding Mendelian and complex genetic traits (e.g., sickle-cell anemia, cystic fibrosis, muscular dystrophy, color-blindness, and hemophilia) to determine patterns of inheritance and disease risk.	Chapter 9: Patterns of Inheritance 9.8 VISUALIZING THE CONCEPT Page 181 9.9 Many inherited traits in humans are controlled by a single gene Page 182 9.9 Many inherited traits in humans are controlled by a single gene Page 182 Table 9.9 Some Autosomal Disorders in Humans Page 182

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Recessive Disorders Page 182 Dominant Disorders Page 182 9.10 New technologies can provide insight into one's genetic legacy Page 183 9.13 A single gene may affect many phenotypic characters Page 186 Figure 9.13B Sickle-cell disease, an example of pleiotropy Page 186
	Gene expression results in the production of proteins and thus determines the phenotypes of the organism. Changes in the DNA occur throughout an	BIO.3C Students will construct an explanation based on evidence to describe how the structure and nucleotide base sequence of DNA	BIO.3C.1 Develop and use models to explain the relationship between DNA, genes, and chromosomes in coding the instructions for the traits transferred from parent to offspring.	Chapter 3: The Molecules of Cells Nucleic Acids 3.13 Proteins are made from amino acids linked by peptide bonds

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	organism's life. Mutations are a source of genetic variation that may have a positive, negative, or no effect on the organism.	determines the structure of proteins or RNA that carry out essential functions of life.		Page 53 3.15 The nucleic acids DNA and RNA are information-rich polymers of nucleotides Page 55 Figure 3.15A A nucleotide Page 55 Figure 3.15D The flow of genetic information in the building of a protein Page 55 Chapter 4: A Tour of the Cell The Nucleus and Ribosomes 4.5 The nucleus contains the cell's genetic instructions Page 65 4.6 Ribosomes make proteins for use in the cell and for export

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				4.6 The locations and structure of ribosomes Page 66 Chapter 8: The Cellular Basis of Reproduction and Inheritance Cell Division and Reproduction 8.1 Cell division plays many important roles in the lives of organisms Page 147 Figure 8.3B Chromosome duplication and distribution Page 149 8.16 Homologous chromosomes may carry different versions of genes Page 162 Figure 8.16A Differing genetic information (coat color and

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				eye color) on homologous chromosomes Page 162 Chapter 9: Patterns of Inheritance 9.17 Genes on the same chromosome tend to be inherited together Page 190 Chapter 10: Molecular Biology of the Gene 10.1 Experiments showed that DNA is the genetic material Page 201 The Flow of Genetic Information from DNA to RNA to Protein 10.6 Genes control phenotypic traits through the expression of proteins Page 206

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				10.7 Genetic information written in codons is translated into amino acid sequences Page 207
			BIO.3C.2 Evaluate the mechanisms of transcription and translation in protein synthesis.	Chapter 10: Molecular Biology of the Gene 10.6 Genes control phenotypic traits through the expression of proteins Page 206 10.7 Genetic information written in codons is translated into amino acid sequences Page 207 10.8 The genetic code dictates how codons are translated into amino acids Page 208 10.9 VISUALIZING THE CONCEPT

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Transcription produces genetic messages in the form of RNA Visualizing the Concept: Transcription produces genetic messages in the form of RNA Page 209 10.10 Eukaryotic RNA is processed before leaving the nucleus as mRNA Page 210 10.11 Transfer RNA molecules serve as interpreters during translation Page 211 10.12 Ribosomes build polypeptides Page 212 to 10.15 Review: The flow of genetic information in the cell is DNA → RNA → protein

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 215 Figure 10.15 A summary of transcription and translation Page 215
			BIO.3C.3 Use models to predict how various changes in the nucleotide sequence (e.g., point mutations, deletions, and additions) will affect the resulting protein product and the subsequent inherited trait.	Chapter 10: Molecular Biology of the Gene 10.16 Mutations can affect genes Page 216 Figure 10.16A The molecular basis of sickle-cell disease Page 216
			BIO.3C.4 Research and identify how DNA technology benefits society. Engage in scientific argument from evidence over the ethical issues surrounding the use of DNA technology (e.g., cloning, transgenic organisms, stem cell research, and the Human Genome Project, gel electrophoresis).	Chapter 10: Molecular Biology of the Gene 10.23 Bacterial plasmids can serve as carriers for gene transfer Page 223 Chapter 12: DNA Technology and Genomics

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Gene Cloning and Editing (12.1–12.5) Pages 250-254 Genetically Modified Organisms (12.6–12.10) Pages 255-259 12.13 Gel electrophoresis sorts DNA molecules by size Page 262 12.15 DNA profiling has provided evidence in many forensic investigations Page 264 12.18 The Human Genome Project revealed that most of the human genome does not consist of genes Page 267 Chapter 31: Plant Structure, Growth, and Reproduction

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				31.15 Plant cloning is an important agricultural tool Page 650
			BIO.3C.5 Enrichment: Investigate current biotechnological applications in the study of the genome (e.g., transcriptome, proteome, individualized sequencing, and individualized gene therapy).	Chapter 12: DNA Technology and Genomics 12.10 Gene therapy may someday help treat a variety of diseases Page 259 12.11 The analysis of genetic markers can produce a DNA profile Page 260 12.15 DNA profiling has provided evidence in many forensic investigations Page 264 Table 12.15 STR Analysis Data that Exonerated Earl Washington Page 264

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				12.20 The field of bioinformatics is expanding our understanding of genomes Page 269
BIO.4 Adaptations and Evolution	Evolution is a key unifying principle in biology. Differentiating between organic and chemical evolution and the analysis of the gradual changes in populations over time, helps students understand common features and differences between species and thus the relatedness between species. There are several factors that affect how natural selection acts on populations within their environments leading to speciation, extinction, and	BIO.4 Students will analyze and interpret evidence to explain the unity and diversity of life.	BIO.4.1 Use models to differentiate between organic and chemical evolution, illustrating the steps leading to aerobic heterotrophs and photosynthetic autotrophs.	Chapter 13: How Populations Evolve Darwin’s Theory of Evolution (13.1–13.7) Pages 276 -282 Chapter 15: Tracing Evolutionary History 15.2 Experiments show that the abiotic synthesis of organic molecules is possible Page 314 Figure 15.2 Diagram showing the synthesis of organic compounds in Miller’s 1953 experiment Page 314

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	the current diversity of life on earth.			15.3 Stages in the origin of the first cells probably included the formation of polymers, protocells, and self-replicating RNA Page 315 Figure 15.3B A hypothesis for the origin of the first genes Page 315 15.4 The origins of single-celled and multicellular organisms and the colonization of land were key events in life's history Page 316 Chapter 17: The Evolution of Plant and Fungal Diversity Plant Evolution and Diversity (17.1–17.2) Pages 360-361

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 18: The Evolution of Invertebrate Diversity Animal Evolution and Diversity (18.1–18.4) Pages 383-386
			BIO.4.2 Evaluate empirical evidence of common ancestry and biological evolution, including comparative anatomy (e.g., homologous structures and embryological similarities), fossil record, molecular/biochemical similarities (e.g., gene and protein homology), and biogeographic distribution.	Chapter 13: How Populations Evolve 13.2 The study of fossils provides strong evidence for evolution Page 277 Checkpoint 13.2 What types of animals do you think would be most represented in the fossil record? Explain your answer. Page 277 13.4 Homologies provide strong evidence for evolution Page 279 13.5 Homologies indicate patterns of descent that can

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				be shown on an evolutionary tree Page 280 Figure 13.5 An evolutionary tree for tetrapods and their closest living relatives, the lungfishes Page 280 Checkpoint 13.5 Refer to the evolutionary tree in Figure 13.5. Are crocodiles more closely related to lizards or birds? Page 280 Chapter 15: Tracing Evolutionary History 15.15 Phylogenies based on homologies reflect evolutionary history Page 327

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 15.15A Relating classification to phylogeny Page 327 15.16 Shared characters are used to construct phylogenetic trees Page 328 15.17 An organism's evolutionary history is documented in its genome Page 329 Figure 15.17 A phylogenetic tree of the bear family (Ursidae) based on mitochondrial DNA Page 329 15.19 Constructing the tree of life is a work in progress Page 331

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 15.19B Two major episodes of horizontal gene transfer in the history of life (dates are uncertain) Page 331
			BIO.4.3 Construct cladograms/phylogenetic trees to illustrate relatedness between species.	Chapter 15: Tracing Evolutionary History 15.15 Phylogenies based on homologies reflect evolutionary history Page 327 15.16 Shared characters are used to construct phylogenetic trees Page 328 Cladistics Page 328 Figure 15.16A Constructing a phylogenetic tree using cladistics Page 328

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 15.16B A phylogenetic tree of reptiles (* indicates extinct lineages) Page 328
			BIO.4.4 Design models and use simulations to investigate the interaction between changing environments and genetic variation in natural selection leading to adaptations in populations and differential success of populations.	Chapter 13: How Populations Evolve 13.6 Darwin proposed natural selection as the mechanism of evolution Page 281 13.7 Scientists can observe natural selection in action Page 282 The Evolution of Populations 13.8 Mutation and sexual reproduction produce the genetic variation that makes evolution possible Page 283 Genetic Variation Page 283

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 13.8 Variation in a population of brown-lipped snails Page 283 13.9 Evolution occurs within populations Page 284 13.10 The Hardy-Weinberg equation can test whether a population is evolving Page 285 Mechanisms of Microevolution 13.12 Natural selection, genetic drift, and gene flow can cause microevolution Page 287 13.13 Natural selection is the only mechanism that consistently leads to adaptive evolution

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 288 13.17 Diploidy and balancing selection preserve genetic variation Page 292 13.18 Natural selection cannot fashion perfect organisms Page 293
			BIO.4.5 Use Darwin's Theory to explain how genetic variation, competition, overproduction, and unequal reproductive success acts as driving forces of natural selection and evolution.	Chapter 13: How Populations Evolve 13.6 Darwin proposed natural selection as the mechanism of evolution Page 281 13.8 Mutation and sexual reproduction produce the genetic variation that makes evolution possible Page 283 Genetic Variation Page 283

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				13.13 Natural selection is the only mechanism that consistently leads to adaptive evolution Page 288 13.14 VISUALIZING THE CONCEPT Natural selection can alter variation in a population in three ways Page 289 13.15 Sexual selection may lead to phenotypic differences between males and females Page 290 13.17 Diploidy and balancing selection preserve genetic variation Page 292 Checkpoint 13.17 Why would natural selection tend to

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				reduce genetic variation more in populations of haploid organisms than in populations of diploid organisms? Page 292
			BIO.4.6 Construct explanations for the mechanisms of speciation (e.g., geographic and reproductive isolation).	Chapter 14: The Origin of Species 14.3 VISUALIZING THE CONCEPT Reproductive barriers keep species separate Page 300 Mechanisms of Speciation 14.4 In allopatric speciation, geographic isolation leads to speciation Page 301 14.5 Reproductive barriers can evolve as populations diverge Page 302 Figure 14.5A Evolution of reproductive barriers in laboratory populations of fruit

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				flies adapted to different food sources Page 302 14.6 Sympatric speciation takes place without geographic isolation Page 303
			BIO.4.7 Enrichment: Construct explanations for how various disease agents (bacteria, viruses, chemicals) can influence natural selection.	Chapter 9: Patterns of Inheritance 9.13 A single gene may affect many phenotypic characters Page 186 Chapter 13: How Populations Evolve 13.16 The evolution of drug-resistant microorganisms is a serious public health concern Page 291 Chapter 37: Communities and Ecosystems

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards Total Standards: 11				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				37.7 Parasites and pathogens can affect community composition Page 763
BIO.5 Interdependence of Organisms and Their Environments	Complex interactions within an ecosystem affect the numbers and types of organisms that survive. Fluctuations in conditions can affect the ecosystem's function, resources, and habitat availability. Ecosystems are subject to carrying capacities and can only support a limited number of organisms and populations. Factors that can affect the carrying capacities of populations are both biotic and abiotic.	BIO.5 Students will Investigate and evaluate the interdependence of living organisms and their environment.	BIO.5.1 Illustrate levels of ecological hierarchy, including organism, population, community, ecosystem, biome, and biosphere.	Chapter 34: The Biosphere: An Introduction to Earth's Diverse Environments 34.1 Ecologists study how organisms interact with their environment at several levels Page 693 Topic Overview Video: Ecological Organization Page 693 Figure 34.1A An organism Figure 34.1B A population Figure 34.1C A community Figure 34.1D An ecosystem Page 693

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				34.3 Physical and chemical factors influence life in the biosphere Page 695 Checkpoint 34.3 Why are birds and mammals found in Himalayan alpine meadows, but non-bird reptiles and amphibians are not? Page 695
			BIO.5.2 Analyze models of the cycling of matter (e.g., carbon, nitrogen, phosphorus, and water) between abiotic and biotic factors in an ecosystem and evaluate the ability of these cycles to maintain the health and sustainability of the ecosystem.	Chapter 34: The Biosphere: An Introduction to Earth's Diverse Environments 34.18 VISUALIZING THE CONCEPT The global water cycle connects aquatic and terrestrial biomes Page 710 Video: Visualizing the Concept: The global water cycle connects aquatic and terrestrial biomes

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 710 Checkpoint 34.18 What is the main way that living organisms contribute to the water cycle? Page 710 Chapter 37: Communities and Ecosystems Ecosystem Structure and Dynamics 37.14 Ecosystem ecology emphasizes energy flow and chemical cycling Page 770 37.15 Primary production sets the energy budget for ecosystems Page 771 37.19 The carbon cycle depends on photosynthesis and respiration

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 775 Figure 37.19 The carbon cycle Page 775 37.20 The phosphorus cycle depends on the weathering of rock Page 776 Figure 37.20 The phosphorus cycle Page 776 37.21 The nitrogen cycle depends on bacteria Page 777 Figure 37.21 The nitrogen cycle Page 777 37.22 A rapid inflow of nutrients degrades aquatic ecosystems

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Checkpoint 37.22 How would excessive addition of mineral nutrients to a lake eventually lead to the loss of many fish species? Page 778
			BIO.5.3 Analyze and interpret quantitative data to construct an explanation for the effects of greenhouse gases on the carbon dioxide cycle and global climate.	Chapter 38: Conservation Biology 38.3 Rapid warming is changing the global climate Page 786 Figure 38.3A VISUALIZING THE DATA Differences in average annual global temperatures compared with 20th-century average Page 786 38.4 Human activities are responsible for rising concentrations of greenhouse gases Page 787

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 38.4A Atmospheric concentrations of CO2, N2O (y axis, left), and CH4 (y axis, right), as of 2014 Page 787 38.5 Climate change affects biomes, ecosystems, communities, and populations Page 788
			BIO.5.4 Develop and use models to describe the flow of energy and amount of biomass through food chains, food webs, and food pyramids.	Chapter 37: Communities and Ecosystems 37.8 Trophic structure is a key factor in community dynamics Figure 37.8 Two food chains Page 764 Checkpoint 37.8 I'm eating a cheese pizza. At which trophic level(s) am I feeding? Page 764 37.9 VISUALIZING THE CONCEPT

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Food chains interconnect, forming food webs Page 765 Checkpoint 37.9 In addition to grasshoppers, the collared lizard shown in the middle of the figure may also eat smaller lizards, which in turn feed on grasshoppers and ants. What trophic levels does the collared lizard occupy when its diet includes smaller lizards as well as grasshoppers? Page 765 37.16 Energy supply limits the length of food chains Page 772 Figure 37.16A The fate of the energy in leaf biomass consumed by a caterpillar Page 772

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 37.16B An idealized energy pyramid Page 772
			BIO.5.5 Evaluate symbiotic relationships (e.g., mutualism, parasitism, and commensalism) and other co-evolutionary (e.g., predator-prey, cooperation, competition, and mimicry) relationships within specific environments.	Chapter 37: Communities and Ecosystems 37.2 Interspecific interactions are fundamental to community structure Page 758 37.3 Competition may occur when a shared resource is limited Page 759 Checkpoint 37.3 Which do you think has more severe effects, intraspecific competition or interspecific competition? Explain why. Page 759 37.4 Mutualism benefits both partners Page 760

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Checkpoint 37.4 When corals are stressed by environmental conditions, they expel their dinoflagellates in a process called bleaching. How is widespread bleaching likely to affect coral reefs? Page 760 37.5 Predation leads to diverse adaptations in prey species Page 761 Checkpoint 37.5 Explain why predation is a powerful factor in the adaptive evolution of prey species. Page761 37.7 Parasites and pathogens can affect community composition Page 763

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Checkpoint 37.7 Use your knowledge of interspecific interactions to explain why tree diversity increased after all the chestnuts died. Page 763
			BIO.5.6 Analyze and interpret population data, both density-dependent and density-independent, to define limiting factors. Use graphical representations (growth curves) to illustrate the carrying capacity within ecosystems.	Chapter 36: Population Ecology 36.2 Density and dispersion patterns are important population variables Page 743 36.3 Life tables track survivorship in populations Page 744 Table 36.3 Life Table for the U.S. Population in 2015 Page 744 Figure 36.3 Three types of survivorship curves Page 744

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				36.4 Idealized models predict patterns of population growth Page 744 Table 36.4A Exponential Growth of Rabbits, r = 0.3 Page 745 Figure 36.4A Exponential growth of rabbits Page 745 36.5 Multiple factors may limit population growth Page 746 Figure 36.5B Increasing mortality of kelp perch (Brachyistius frenatus, inset) with increasing density Page 746 Figure 36.5C Weather change as a density-independent

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				factor limiting aphid population growth Page 746 36.6 Some populations have "boom-and-bust" cycles Page 747 Figure 36.6 Population cycles of the snowshoe hare and the lynx Page 747
			BIO.5.7 Investigate and evaluate factors involved in primary and secondary ecological succession using local, real world examples.	Chapter 37: Communities and Ecosystems 37.12 Disturbance is a prominent feature of most communities Page 768 Figure 37.12A Primary succession on a lava flow Page 768 Figure 37.12B Secondary succession: Yellowstone

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				National Park in November 1988, after a fire (top), and in July 1989 Page 768
			BIO.5.8 Enrichment: Use an engineering design process to create a solution that addresses changing ecological conditions (e.g., climate change, invasive species, loss of biodiversity, human population growth, habitat destruction, biomagnification, or natural phenomena).*	Chapter 37: Communities and Ecosystems 37.17 An energy pyramid explains the ecological cost of meat Page 773 Figure 37.17 Food energy available to people eating at different trophic levels Page 773 Chapter 38: Conservation Biology Conservation Biology and Restoration Ecology 38.7 Protecting endangered populations is one goal of conservation biology Page 790

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Checkpoint 38.7 What do you think is the first priority for conservation biologists when they select a site for ferret reintroduction? Page 790 38.8 Sustaining ecosystems and landscapes is a conservation priority Page 791 38.9 Establishing protected areas slows the loss of biodiversity Page 792 38.10 Zoned reserves are an attempt to reverse ecosystem disruption Page 793 38.11 The Yellowstone to Yukon Conservation Initiative seeks to preserve biodiversity

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				by connecting protected areas Page 794 38.12 The study of how to restore degraded habitats is a developing science Page 795 Checkpoint 38.12 How will the Kissimmee River Restoration Project improve water quality in the Everglades ecosystem? Page 795 38.13 Sustainable development is an ultimate goal Page 796 Checkpoint 38.13 Why is a concern for the well-being of future generations essential for progress toward sustainable development? Page 796

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Campbell, Biology: Concepts & Connections 10th edition ©2021				
Biology Standards **Total Standards: 11**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			BIO.5.9 Enrichment: Use an engineering design process to investigate and model current technological uses of biomimicry to address solutions to real-world problems.*	Chapter 35: Behavioral Adaptations to the Environment 35.6 Imprinting poses problems and opportunities for conservation programs Figure 35.6A A whooping crane chick interacting with a puppet "parent" Page 720

Objectives identified by "Enrichment:" are considered enrichment material that may be expanded upon as time permits. Engineering standards are represented in some performance objectives with specific wording that will prompt students to approach learning and exploration using the engineering process. These performance objectives are marked with an * at the end of the statement.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
CHE.1 Mathematical and Computational Analysis	Mathematical and computational analysis is a key component of scientific investigation and prediction of outcomes. These components create a more student-centered classroom.	CHE.1 Students will use mathematical and computational analysis to evaluate problems.	CHE.1.1 Use dimensional analysis (factor/label) and significant figures to convert units and solve problems.	Chapter 2: Measurement and Problem Solving 2.3 Significant Figures: Writing Numbers to Reflect Precision Pages 19-25 2.6 Problem Solving and Unit Conversion Pages 31-35 2.7 Solving Multistep Unit Conversion Problems Pages 36-27 Chapter 2: Exercises Significant Figures Q 41-46 Page 54 Unit Conversion Q 69-86 Pages 57-59
			CHE.1.2 Design and conduct experiments using appropriate	Chapter 11: Gases

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			measurements, significant figures, graphical analysis to analyze data.	11.4 Boyle's Law: Pressure and Volume Pages 373-378 11.5 Charles's Law: Volume and Temperature Pages 378-382 Chapter 11: Exercises Highlight Problems Q 129 Page 413 Graphical Analysis Chapter 11: Exercises Data Interpretation and Analysis Q 134 Page 415
			CHE.1.3 Enrichment: Research information from multiple appropriate sources and assess the credibility, accuracy, possible bias, and conclusions of each publication.	The text does not provide an opportunity for students to try this enrichment activity.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
CHE.2 Atomic Theory	Atomic theory is the foundation of modern chemistry concepts. Students must be presented with a solid foundation of the atom and its components. These concepts lead to an understanding of the interactions of these components to explain macro-observations of the world.	CHE.2 Students will demonstrate an understanding of the atomic structure and the historical developments leading to modern atomic theory.	CHE.2.1 Investigate the historical progression leading to the modern atomic theory, including, but not limited to, work done by Dalton, Rutherford's gold foil experiment, Thomson's cathode ray experiment, Millikan's oil drop experiment, and Bohr's interpretation of bright line spectra.	Chapter 4: Atoms and Elements 4.3 The Nuclear Atom Pages 107-109 Chapter 4: Exercises Q 2, 3, 4 Page 131 Chapter 9: Electrons in Atoms and the Periodic Table 9.4 The Bohr Model: Atoms in Orbits Pages 300-302 Chapter 9: Exercises Q 1 Page 324
			CHE.2.2 Construct models (e.g., ball and stick, online simulations, mathematical computations) of atomic nuclei to explain the abundance weighted average (relative mass) of elements and	Chapter 4: Atoms and Elements 4.9 Atomic Mass: The Average Mass of An Element's Atoms Pages 125-126 Chapter 4: Exercises Problems

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			isotopes on the published mass of elements.	Q 101-106 Page 137
			CHE.2.3 Investigate absorption and emission spectra to interpret explanations of electrons at discrete energy levels using tools such as online simulations, spectrometers, prisms, flame tests, and discharge tubes. Explore both laboratory experiments and real-world examples.	Partial coverage: The text does not cover absorption spectra using online simulations, spectrometers, or flame tests. Students do not examine lab experiments or real-world examples. The citations below are for emission spectra using prisms. Chapter 9: Electrons in Atoms and the Periodic Table 9.4 The Bohr Model: Atoms in Orbits Pages 300-302 Chapter 9: Exercises Q 14 Page 324 The Bohr Model Q 41, 42 Page 325

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards Total Standards: 12				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.2.4 Research appropriate sources to evaluate the way absorption and emission spectra are used to study astronomy and the formation of the universe.	The text does not cover this concept.
CHE.3 Periodic Table	Modern chemistry is based on the predictability of atomic behavior. Periodic patterns in elements led to the development of the periodic table. Electron configuration is a direct result of this periodic behavior. The predictable behavior of electrons has led to the discovery of new compounds, elements, and atomic interactions. Predictability of atom behavior is a key to understanding ionic and covalent bonding and production of compounds or molecules.	CHE.3 Students will demonstrate an understanding of the periodic table as a systematic representation to predict properties of elements.	CHE.3.1 Explore and communicate the organization of the periodic table, including history, groups, families, family names, metals, nonmetals, metalloids, and transition metals.	Chapter 4: Atoms and Elements 4.6 Looking for Patterns: The Periodic Law and the Periodic Table Pages 114-118 Chapter 4: Exercises Q 13-18 Page 130

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.3.2 Analyze properties of atoms and ions (e.g., metal/nonmetal/metalloid behavior, electrical/heat conductivity, electronegativity and electron affinity, ionization energy, and atomic/ionic radii) using periodic trends of elements based on the periodic table.	Chapter 4: Atoms and Elements 4.6 Looking for Patterns: The Periodic Law and the Periodic Table Pages 114-118 4.7 Ions: Losing and Gaining Electrons Pages 118-121 Chapter 4: Exercises Q 19-21 Page 130
			CHE.3.3 Analyze the periodic table to identify quantum numbers (e.g., valence shell electrons, energy level, orbitals, sublevels, and oxidation numbers).	Chapter 9: Electrons in Atoms and the Periodic Table 9.5 The Quantum-Mechanical Model: Atoms with Orbitals Pages 302-303 9.6 Quantum-Mechanical Orbitals and Electron Configurations Pages 304-310 9.7 Electron Configurations and the Periodic Table Pages 310-313

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 9: Exercises Q 18-20 Page 324 Problems Q 65-68 Page 326
CHE.4 Bonding	A firm understanding of bonding is necessary to further development of the basic chemical concepts of compounds and chemical interactions.	CHE.4 Students will demonstrate an understanding of the types of bonds and resulting atomic structures for the classification of chemical compounds.	CHE.4.1 Develop and use models (e.g., Lewis dot, 3-D ball-stick, 3-D printing, or simulation programs such as PhET) to predict the type of bonding between atoms and the shape of simple compounds.	Chapter 10: Chemical Bonding 10.2 Representing Valence Electrons with Dots Pages 334-335 10.7 Predicting the Shape of Molecules Pages 344-348 Chapter 10: Exercises Q 3 Page 358 Problems Q 23-34 Page 358 Q 65-78

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Pages 360-361
			CHE.4.2 Use models such as Lewis structures and ball and stick models to depict the valence electrons and their role in the formation of ionic and covalent bonds.	Chapter 10: Chemical Bonding 10.3 Lewis Structures of Ionic Compounds: Electrons Transferred Pages 335-336 10.4 Covalent Lewis Structures: Electrons Shared Pages 336-338 10.5 Writing Lewis Structures for Covalent Compounds Pages 339-341 Chapter 10: Exercises Q 5, 8 Page 358 Problems Q 35-54 Pages 358-359
			CHE.4.3 Predict the ionic or covalent nature of different	Chapter 10: Chemical Bonding

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			atoms based on electronegativity trends and/or position on the periodic table.	10.8 Electronegativity and Polarity: Why Oil and Water Don't Mix Page 349 Chapter 10: Exercises Cumulative Problems Q 97-98 Page 362
			CHE.4.4 Use models and oxidation numbers to predict the type of bond, shape of the compound, and the polarity of the compound.	Partial coverage: The text does not explain how oxidation numbers can be used to predict the type of bond, shape of the compound, etc. The citations below use the Lewis model, the space-filling model, and the ball-and-stick model. Chapter 10: Chemical Bonding 10.8 Electronegativity and Polarity: Why Oil and Water Don't Mix Page 349 Chapter 10: Exercises Cumulative Problems Q 97-98 Page 362

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.4.5 Use models of simple hydrocarbons to exemplify structural isomerism.	Chapter 18: Organic Chemistry 18.6 Isomers: Same Formula, Different Structure Pages 655-656 Chapter 18: Exercises Q 39-42 Page 684
			CHE.4.6 Use mathematical and computational analysis to determine the empirical formula and the percent composition of compounds.	Chapter 6: Chemical Compounds 6.6 Mass Chemical Composition of Compounds Page 191 6.7 Mass Percent Composition from a Chemical Formula Pages 192-193 6.8 Calculating Empirical Formulas for Compounds Pages 194-195 Chapter 6: Exercises Q 8, 11-16 Page 205

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards Total Standards: 12				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Problems Q 83-102 Pages 209-210
			CHE.4.7 Use scientific investigation to determine the percentage of composition for a substance (e.g., sugar in gum, water and/or unpopped kernels in popcorn, percent water in a hydrate). Compare results to justify conclusions based on experimental evidence.	The text does not cover this topic. The citation below is for instances where students calculate percentage composition using mathematical computations and from chemical formulae. Chapter 6: Exercises Problems Q 78-79, 83-90 Page 208, 209
			CHE.4.8 Plan and conduct controlled scientific investigations to produce mathematical evidence of the empirical composition of a compound.	The text does not cover this standard.
CHE.5 Naming Compounds	Polyatomic ions (radicals) and oxidation numbers are used to predict how	CHE.5 Students will investigate and understand the accepted	CHE.5.1 Use the periodic table and a list of common polyatomic ions as a model to derive	Chapter 5: Molecules and Compounds 5.7 Naming Ionic Compounds

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	metallic ions, nonmetals, and transition metals are used in naming compounds.	nomenclature used to identify the name and chemical formulas of compounds.	chemical compound formulas from compound names and compound names from chemical formulas.	Pages 153-156 Chapter 5: Exercises Q 13-17 Page 167 Problems Q 59-66 Page 170
			CHE.5.2 Generate formulas of ionic and covalent compounds from compound names. Discuss compounds in everyday life and compile lists and uses of these chemicals.	Chapter 5: Exercises Questions for Group Work Q 112, 114 Page 175
			CHE.5.3 Generate names of ionic and covalent compounds from their formulas. Name binary compounds, binary acids, stock compounds, ternary compounds, and ternary acids.	Partial coverage: The text does not cover ternary compounds and ternary acids. Chapter 5: Molecules and Compounds 5.7 Naming Ionic Compounds Pages 152-156 Chapter 5: Exercises

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Problems Q 59-66 Page 170
CHE.6 Chemical Reactions	Understanding chemical reactions and predicting products of these reactions is essential to student success.	CHE.6 Students will demonstrate an understanding of the types, causes, and effects of chemical reactions.	CHE.6.1 Develop and use models to predict the products of chemical reactions (e.g., synthesis reactions; single replacement; double displacement; and decomposition, including exceptions such as decomposition of hydroxides, chlorates, carbonates, and acids). Discuss and/or compile lists of reactions used in everyday life.	Partial coverage: Students learn about the different types of chemical reactions, but they do not use models to predict the products. Chapter 7: Chemical Reactions 7.1 Grade School Volcanoes, Automobiles, and Laundry Detergents Page 216 7.10 Classifying Chemical Reactions Classifying Chemical Reactions by What Atoms Do Pages 238-240
			CHE.6.2 Plan, conduct, and communicate the results of investigations to demonstrate different types of simple chemical reactions.	The text does not require students to carry out investigations to demonstrate different chemical reactions and communicate the results.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.6.3 Use mathematics and computational analysis to represent the ratio of reactants and products in terms of masses, molecules, and moles (stoichiometry).	Chapter 8: Quantities in Chemical Reactions 8.3 Making Molecules: Mole-to-Mole Conversions Pages 259-261 8.4 Making Molecules: Mass-to-Mass Conversions Pages 261-263 Chapter 8: Exercises Q 2 Page 281 Problems Q 15-45 Pages 281-283
			CHE.6.4 Use mathematics and computational analysis to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. Give real-world examples (e.g., burning wood).	Chapter 7: Chemical Reactions 7.3 The Chemical Equation Pages 219-220

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.6.5 Plan and conduct a controlled scientific investigation to produce mathematical evidence that mass is conserved. Use percent error to analyze the accuracy of results.	The text does not cover this concept.
			CHE.6.6 Use mathematics and computational analysis to support the concept of percent yield and limiting reagent.	Chapter 8: Quantities in Chemical Reactions 8.5 More Pancakes: Limiting Reactant, Theoretical Yield, and Percent Yield Pages 264-268 Chapter 8: Exercises Problems Q 47-72 Pages 284-287
			CHE.6.7 Plan and conduct a controlled scientific investigation to produce mathematical evidence to predict and confirm the limiting reagent and percent yield in the reaction. Analyze quantitative data, draw	Partial coverage: Students do not plan and conduct scientific investigations. However, the following question requires them to analyze quantitative data, draw conclusions, and communicate findings.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			conclusions, and communicate findings. Compare and analyze class data for validity.	Chapter 8: Exercises Data Interpretation and Analysis Q 110 Page 291
CHE.7 Gas Laws	The comparison and development of the molecular states of matter are an integral part of understanding matter. Pressure, volume, and temperature are imperative to understanding the states of matter.	CHE.7 Students will demonstrate an understanding of the structure and behavior of gases.	CHE.7.1 Analyze the behavior of ideal and real gases in terms of pressure, volume, temperature, and number of particles.	Chapter 11: Gases 11.8 The Ideal Gas Law: Pressure, Volume, Temperature, and Moles Pages 386-392 Chapter 11: Exercises Q 14, 15 Page 409
			CHE.7.2 Enrichment: Use an engineering design process to develop models (e.g., online simulations or student interactive activities) to explain and predict the behavior of each state of matter using the movement of particles and intermolecular forces to explain the behavior of matter.*	Partial coverage: students learn about the theory but do not develop models using engineering design processes. Chapter 11: Gases 11.2 Kinetic Molecular Theory: A Model for Gases Pages 369-370

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards Total Standards: 12				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 11: Exercises Highlight Problems Q 129 Page 413
			CHE.7.3 Analyze and interpret heating curve graphs to explain the energy relationship between states of matter (e.g., thermochemistry-water heating from -20^{o}C to 120^{o}C).	Chapter 12: Liquids, Solids, and Intermolecular Forces 12.5 Melting, Freezing, and Sublimation Pages 426-429
			CHE.7.4 Use mathematical computations to describe the relationships comparing pressure, temperature, volume, and number of particles, including Boyle's law, Charles's law, Dalton's law, combined gas laws, and ideal gas laws.	Chapter 11: Gases 11.4 Boyle's Law: Pressure and Volume Pages 373-378 11.5 Charles's Law: Volume and Temperature Pages 378-382 11.6 The Combined Gas Law: Pressure, Volume, and Temperature Pages 382-384

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				11.8 The Ideal Gas Law: Pressure, Volume, Temperature, and Moles Pages 386-392 11.9 Mixture of Gases Pages 392-394
			CHE.7.5 Enrichment: Use an engineering design process and online simulations or lab investigations to design and model the results of controlled scientific investigations to produce mathematical evidence that confirms the gas-laws relationships.*	The text does not cover this concept.
			CHE.7.6 Use the ideal gas law to support the prediction of volume, mass, and number of particles produced in chemical reactions (i.e., gas stoichiometry).	Chapter 11: Gases 11.8 The Ideal Gas Law: Pressure, Volume, Temperature, and Moles Pages 386-392 Chapter 11: Exercises Problems Q 69-70 Page 409

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.7.7 Plan and conduct controlled scientific investigations to produce mathematical evidence that confirms that reactions involving gases conform to the law of conservation of mass.	The text does not cover this concept.
			CHE.7.8 Enrichment: Using gas stoichiometry, calculate the volume of carbon dioxide needed to inflate a balloon to occupy a specific volume. Use an engineering design process to design, construct, evaluate, and improve a simulated air bag.*	Chapter 11: Exercises Highlight Problems Q 127 Page 413
CHE.8 Solutions	Solutions exist as solids, liquids, or gases. Solution concentration is expressed by specifying relative amounts of solute to solvent.	CHE.8 Students will demonstrate an understanding of the nature of properties of various types of chemical solutions.	CHE.8.1 Use mathematical and computational analysis to quantitatively express the concentration of solutions using the concepts such as molarity, percent by mass, and dilution.	Chapter 13: Solutions 13.5 Specifying Solution Concentration: Mass Percent Pages 460-462 13.6 Specifying Solution Concentration: Molarity Pages 463-466 13.7 Solution Dilution

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Pages 466-468 Chapter 13: Exercises Problems Q 43-90 Pages 484-487
			CHE.8.2 Develop and use models (e.g., online simulations, games, or video representations) to explain the dissolving process in solvents on the molecular level.	Chapter 13: Solutions 13.3 Solutions of Solids Dissolved in Water: How to Make Rock Candy Pages 455-458
			CHE.8.3 Analyze and interpret data to predict the effect of temperature and pressure on solids and gases dissolved in water.	Partial coverage: The text explains the concept of gases dissolved in water but does not analyze and interpret data. Chapter 13: Solutions 13.4 Solutions of Gases in Water: How Soda Pop Gets Its Fizz Pages 458-460 Chapter 13: Exercises Problems Q 42 Page 484

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.8.4 Design, conduct, and communicate the results of experiments to test the conductivity of common ionic and covalent compounds in solution.	Chapter 14: Acids and Bases 14.7 Strong and Weak Acids and Bases Pages 505-509
			CHE.8.5 Use mathematical and computational analysis to analyze molarity, molality, dilution, and percentage dilution problems.	Chapter 13: Solutions Chapter 13: Exercises Problems Q 42 Page 484
			CHE.8.6 Design, conduct, and communicate the results of experiments to produce a specified volume of a solution of a specific molarity, and dilute a solution of a known molarity.	Partial coverage: Students learn about the concepts but do not conduct experiments. Chapter 13: Solutions 13.6 Specifying Solution Concentration: Molarity Pages 463-466 13.7 Solution Dilution Pages 466-468

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards Total Standards: 12				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			CHE.8.7 Use mathematical and computational analysis to predict the results of reactions using the concentration of solutions (i.e., solution stoichiometry).	Chapter 13: Solutions 13.8 Solution Stoichiometry Pages 468-471 Chapter 13: Exercises Problems Q 91-98 Page 487
			CHE.8.8 Enrichment: Investigate parts per million and/or parts per billion as it applies to environmental concerns in your geographic region, and reference laws that govern these factors.	Chapter 13: Exercises Data Interpretation and Analysis Q 143 Page 490
CHE.9 Acids and Bases (Enrichment)		CHE.9 Enrichment: Students will understand the nature and properties of acids, bases, and salt solutions.	CHE.9.1 Enrichment: Analyze and interpret data to describe the properties of acids, bases, and salts.	Chapter 14: Acids and Bases 14.9 The pH and pOH Scales: Ways to Express Acidity and Basicity Page 512
			CHE.9.2 Enrichment: Analyze and interpret data to identify differences between strong and weak acids and bases (i.e., dissociation).	Chapter 14: Acids and Bases 14.7 Strong and Weak Acids and Bases Pages 505-509

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 14: Exercises Questions Q 20 Page 524 Problems Q 54-61 Page 526 Highlight Problems Q 121 Page 530
			CHE.9.3 Enrichment: Plan and conduct investigations using the pH scale to classify acid and base solutions.	Chapter 14: Acids and Bases 14.9 The pH and pOH Scales: Ways to Express Acidity and Basicity Page 512 Chapter 14: Exercises Problems Q 63-70 Page 527
			CHE.9.4 Enrichment: Analyze and evaluate the Arrhenius, Bronsted-Lowry, and Lewis acid-base definitions.	Chapter 14: Acids and Bases 14.4 Molecular Definitions of Acids and Bases Pages 497-499

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 14: Exercises Questions Q 7-10 Page 524 Problems Q 29-32 Page 524
			CHE.9.5 Enrichment: Use mathematical and computational thinking to calculate pH from the hydrogen-ion concentration.	Chapter 14: Acids and Bases 14.9 The pH and pOH Scales: Ways to Express Acidity and Basicity Page 512 Chapter 14: Exercises Problems Q 63-70 Page 527
			CHE.9.6 Enrichment: Obtain, evaluate, and communicate information about how buffers stabilize pH in acid-base reactions.	Chapter 14: Acids and Bases 14.10 Buffers: Solutions That Resist pH Change Pages 516-518 Chapter 14: Exercises Questions

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards Total Standards: 12				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Q 27-28 Page 524 Problems Q 89-92 Page 529
CHE.10 Thermochemistry (Enrichment)		CHE.10 Enrichment: Students will understand that energy is exchanged or transformed in all chemical reactions.	CHE.10.1 Enrichment: Construct explanations to explain how temperature and heat flow in terms of the motion of molecules (or atoms).	Chapter 3: Matter and Energy Chapter 13: Exercises Highlight Problems Q 121 Page 101
			CHE.10.2 Enrichment: Classify chemical reactions and phase changes as exothermic or endothermic based on enthalpy values. Use a graphical representation to illustrate the energy changes involved.	Chapter 8: Quantities in Chemical Reactions 8.7 Enthalpy: A Measure of the Heat Evolved or Absorbed in a Reaction Pages 272-275 Chapter 8: Exercises Questions Q 14 Page 281 Problems Q 73-74

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 287
			CHE.10.3 Enrichment: Analyze and interpret data from energy diagrams and investigations to support claims that the amount of energy released or absorbed during a chemical reaction depends on changes in total bond energy.	The text does not cover this topic.
			CHE.10.4 Enrichment: Use mathematical and computational thinking to solve problems involving heat flow and temperature changes, using known values of specific heat and latent heat of phase change.	Chapter 3: Matter and Energy 3.12 Energy and Heat Capacity Calculations Pages 86-89 Chapter 3: Exercises Problems Q 79-82 Page 99
CHE.11 Equilibrium (Enrichment)		CHE.11 Enrichment: Students will understand that chemical equilibrium is a dynamic process at the molecular level.	CHE.11.1 Enrichment: Construct explanations to explain how to use Le Chatelier's principle to predict the effect of changes in concentration, temperature, and pressure.	Chapter 15: Chemical Equilibrium 15.8 The Effect of a Concentration Change on Equilibrium Pages 548-550 15.9 The Effect of a Volume Change on Equilibrium

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Pages 550-552 15.10 The Effect of a Temperature Change on Equilibrium Pages 553-555 Chapter 15: Exercises Questions Q 18-27 Page 566
			CHE.11.2 Enrichment: Predict when equilibrium is established in a chemical reaction.	Chapter 15: Chemical Equilibrium 15.3 The Idea of Dynamic Chemical Equilibrium Pages 537-539 Chapter 15: Exercises Questions Q 8, 10 Page 566
			CHE.11.3 Enrichment: Use mathematical and computational thinking to calculate an equilibrium constant expression for a reaction.	Chapter 15: Chemical Equilibrium 15.6 Calculating and Using Equilibrium Constants Pages 543-545 Chapter 15: Exercises

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Problems Q 51-64 Page 568-569
CHE.12 Organic Nomenclature (Enrichment)		CHE.12 Enrichment: Students will understand that the bonding characteristics of carbon allow the formation of many different organic molecules with various sizes, shapes, and chemical properties.	CHE.12.1 Enrichment: Construct explanations to explain the bonding characteristics of carbon that result in the formation of basic organic molecules.	Chapter 18: Organic Chemistry 18.3 Carbon: A Versatile Atom Pages 647-649 Chapter 18: Exercises Questions Q 5 Page 683
			CHE.12.2 Enrichment: Obtain information to communicate the system used for naming the basic linear hydrocarbons and isomers that contain single bonds, simple hydrocarbons with double and triple bonds, and simple molecules that contain a benzene ring.	Chapter 18: Organic Chemistry 18.4 Hydrocarbons: Compounds Containing Only Hydrogen and Carbon Pages 649-650 18.5 Alkanes: Saturated Hydrocarbons Pages 651-654 18.6 Isomers: Same Formula, Different Structure

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Pages 655-656 18.7 Naming Alkanes Pages 657-659 Chapter 18: Exercises Problems Q 43-44 Page 684
			CHE.12.3 Enrichment: Develop and use models to identify the functional groups that form the basis of alcohols, ketones, ethers, amines, esters, aldehydes, and organic acids.	Chapter 18: Organic Chemistry 18.11 Functional Groups Page 667 18.12 Alcohol Pages 668-669 18.13 Ethers Page 670 18.14 Aldehydes and Ketones Page 671 18.15 Carboxylic Acids and Esters Page 672

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Tro, Introductory Chemistry, © 2024				
Chemistry Standards **Total Standards: 12**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 18: Exercises Problems Q 83-86 Page 689

Objectives identified by "Enrichment:" are considered enrichment material that may be expanded upon as time permits. Engineering standards are represented in some performance objectives with specific wording that will prompt students to approach learning and exploration using the engineering process. These performance objectives are marked with an * at the end of the statement.

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
FB.1 History of Biology and Impacts on Society	FB.1 Students will relate the importance of significant historical biological experiments and their impact of these on research, development, and society.	FB.1.1 Identify and communicate the contributions of famous scientists and their experiments that formed fundamental scientific principles (e.g., Robert Hooke, Schleiden/ Schwann/Virchow, Griffith, Avery/MacLeod/McCarty, Hershey/Chase, Rosalind Franklin, Gregor Mendel, Watson/Crick, Pasteur, and Charles Darwin).	Chapter 1: Biology: Exploring Life 1.9 Theme: Evolution is the core theme of biology Page 10 Chapter 4: A Tour of the Cell 4.0 Microscopes reveal a startling new view of life Page 60 Introduction to the Cell 4.1 Microscopes reveal the world of the cell Page 61
		FB.1.2 Trace and model the historical development of scientific ideas and theories (e.g., creation of the microscope, discovery of cells/cell theory, discovery of DNA/RNA, double helical shape of DNA, evolution/natural selection, endosymbiosis) through the development of a timeline.	Chapter 1: Biology: Exploring Life 1.9 Theme: Evolution is the core theme of biology Page 10 Chapter 4: A Tour of the Cell 4.0 Microscopes reveal a startling new view of life Page 60

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			4.15: EVOLUTION CONNECTION Mitochondria and chloroplasts evolved by endosymbiosis Page 75 4.17 Scientists discovered the cytoskeleton using the tools of biochemistry and microscopy Page 77
		FB.1.3 Research, analyze, explain, and communicate how scientific enterprise relates to society and classic inventions (e.g., microscope, blood typing, gel electrophoresis equipment, DNA sequencing technology).	Chapter 1: Biology: Exploring Life 1.7 The process of science is repetitive, nonlinear, and collaborative Page 8 1.8 Biology, technology, and society are connected in important ways Checkpoint 1.8 How do science and technology interact? Page 9
		FB.1.4 Enrichment: Research, analyze, explain, and communicate the influence of society, including cultural components, on the direction and progress of science and technology (e.g., medical treatments, emerging viruses, antibiotic resistance, vaccinations and re-emergent diseases,	Chapter 1: Biology: Exploring Life 1.7 The process of science is repetitive, nonlinear, and collaborative Page 8 1.8 Biology, technology, and society are connected in important ways

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
		alternative energy development, and/or biomimicry.	Checkpoint 1.8 How do science and technology interact? Page 9
FB.2 The Chemistry of Life	FB.2 Students will demonstrate an understanding of the structure and interactions of matter and how the organization of matter supports living organisms.	FB.2.1 Develop and use simple atomic models to describe the components of elements (e.g., relative position, charges of protons, neutrons, and electrons).	Chapter 2: The Chemical Basis of Life 2.3 Atoms consist of protons, neutrons, and electrons Page 23 Figure 2.3 Two models of a helium atom. (Note that these models are not to scale; they greatly overestimate the size of the nucleus in relation to the electron cloud.) Page 23
		FB.2.2 Obtain and use information about elements (e.g., chemical symbol, atomic number, atomic mass, and group or family) to describe the organization of the periodic table.	Chapter 2: The Chemical Basis of Life 2.3 Atoms consist of protons, neutrons, and electrons Page 23 Figure 2.3 Two models of a helium atom. (Note that these models are not to scale; they greatly overestimate the size of the nucleus in relation to the electron 2.4 Radioactive isotopes can help or harm us Page 24

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			2.5 The distribution of electrons determines an atom's chemical properties Page 25 Figure 2.5B The electron distribution diagrams of the first 18 elements in the periodic table Page 25
		FB.2.3 Relate chemical reactivity to an element's position on the periodic table. Use this information to determine what type of bond will form between elements (ionic, covalent, hydrogen).	Chapter 2: The Chemical Basis of Life 2.5 The distribution of electrons determines an atom's chemical properties Page 25 2.6 VISUALIZING THE CONCEPT Covalent bonds join atoms into molecules through electron sharing Page 26 2.7 Ionic bonds are attractions between ions of opposite charge Page 27 2.8 Hydrogen bonds are weak bonds important in the chemistry of life Page 28

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			2.9 Chemical reactions make and break chemical bonds Page 29
		FB.2.4 Analyze and interpret data to classify common solutions as acids, bases, or neutral. Communicate the importance of pH in living systems.	Chapter 2: The Chemical Basis of Life 2.14 The chemistry of life is sensitive to acidic and basic conditions Page 34 Checkpoint 2.14 Page 34 2.15 Scientists study the effects of rising atmospheric CO2 on coral reef ecosystems Page 35
		FB.2.5 Investigate how the properties of water (e.g., cohesion, adhesion, heat capacity, solvent properties) contribute to the maintenance of living cells and organisms.	Chapter 2: The Chemical Basis of Life Water's Life-Supporting Properties Page 30 2.10 Hydrogen bonds make liquid water cohesive 2.13 Water is the solvent of life Page 33
		FB.2.6 Explain the role of the major biomolecules (carbohydrates, proteins -	Chapter 3: The Molecules of Cells

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
		including enzymes, lipids, and nucleic acids) to the survival of living organisms.	3.2 A few chemical groups are key to the functioning of biological molecules Page 42 3.3 Cells make large molecules from a limited set of small molecules Page 43 3.7 Polysaccharides are long chains of sugar units Page 47 Lipids 3.8 Fats are lipids that are mostly energy-storage molecules Lipids Page 48 Proteins 3.10 Phospholipids and steroids are important lipids with a variety of functions Page 50 3.12 Proteins have a wide range of functions and structures Page 52

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Nucleic Acids 3.15 The nucleic acids DNA and RNA are information-rich polymers of nucleotides Page 55
		FB.2.7 Enrichment: Explore the structure of biomolecules using molecular models. Relate the structure of biomolecules to their function in living things (discuss types bonding, importance of the strength and weakness of the bond in function, energy in bonds, enzyme function).	Chapter 3: The Molecules of Cells 3.2 A few chemical groups are key to the functioning of biological molecules Page 42 3.3 Cells make large molecules from a limited set of small molecules Page 43 Carbohydrates 3.4 Monosaccharides are the simplest carbohydrates Page 44 3.5 Two monosaccharides are linked to form a disaccharide Page 45

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			3.7 Polysaccharides are long chains of sugar units Page 47 3.8 Fats are lipids that are mostly energy-storage molecules Page 48 3.10 Phospholipids and steroids are important lipids with a variety of functions Page 50 3.12 Proteins have a wide range of functions and structures Page 52 3.13 Proteins are made from amino acids linked by peptide bonds Page 52 3.14 VISUALIZING THE CONCEPT A protein's functional shape results from four levels of structure Page 54

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Nucleic Acids 3.15 The nucleic acids DNA and RNA are information-rich polymers of nucleotides Page 55 Chapter 5: The Working Cell How Enzymes Function 5.13 Enzymes speed up the cell's chemical reactions by lowering energy barriers Chapter 3: The Molecules of Cells 3.16 Lactose tolerance is a recent event in human evolution Page 56
FB.3 Organization and Energy in Living Systems	FB.3 Students will demonstrate an understanding of how the structure of living organisms supports the essential functions of life.	FB.3.1 Compare and contrast prokaryotic/eukaryotic and plant/animal/bacteria cells.	Chapter 4: A Tour of the Cell 4.3 Prokaryotic cells are structurally simpler than eukaryotic cells Page 63 4.4 Eukaryotic cells are partitioned into functional compartments Page 64 4.19 The extracellular matrix of animal cells functions in support and regulation

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Page 79 4.20 Three types of cell junctions are found in animal tissues Page 80 4.21 Cell walls enclose and support plant cells Page 81 Chapter 16: Microbial Life: Prokaryotes and Protists Prokaryotes 16.1 Prokaryotes are diverse and widespread Page 337 16.12 Protists are an extremely diverse assortment of eukaryotes Page 348
		FB.3.2 Use models to investigate and explain structures within living cells that support life (e.g., cytoplasm, cell membrane, cell wall, nucleus, mitochondria, chloroplasts, lysosomes, Golgi, vacuoles, ER, ribosomes,	Chapter 4: A Tour of the Cell 4.5 The nucleus contains the cell's genetic instructions Page 65 to 4.21 Cell walls enclose and support plant cells Page 81

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
		chromosomes, centrioles, cytoskeleton, nucleolus, nuclear membrane).	4.22 Review: Eukaryotic cell structures can be grouped on the basis of four main functions Page 82
		FB.3.3 Compare and contrast active and passive cellular transport. Analyze the movement of water across a cell membrane in hypotonic, isotonic, and hypertonic solutions.	Chapter 5: The Working Cell 5.3 Passive transport is diffusion across a membrane with no energy investment Page 89 5.4 Osmosis is the diffusion of water across a membrane Page 90 5.5 Water balance between cells and their surroundings is crucial to organisms Page 91 5.8 Cells expend energy in the active transport of a solute Page 94
		FB.3.4 Analyze the relationship between photosynthesis and cellular respiration and explain that relationship in terms of the need for all living things to acquire energy from their environment.	Chapter 5: The Working Cell 5.10 Cells transform energy and matter as they perform work Page 96 Chapter 6: How Cells Harvest Chemical Energy

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Cellular Respiration: Aerobic Harvesting of Energy 6.1 Photosynthesis and cellular respiration provide energy for life Page 107 6.16 Cells use many kinds of organic molecules as fuel for cellular respiration Page 122
		FB 3.5 Use models to explain how ADP and ATP cycle to store and release chemical energy using inorganic phosphate.	Chapter 5: The Working Cell 5.10 Cells transform energy and matter as they perform work Page 96 Figure 5.10 An illustration of the two laws of thermodynamics: transformation of energy and increase in entropy Page 96 5.12 ATP drives cellular work by coupling exergonic and endergonic reactions Page 98 Figure 5.12A The hydrolysis of ATP yielding ADP, a phosphate group, and energy

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Page 98 Figure 5.12B How ATP powers cellular work Page 98 Figure 5.12C The ATP cycle Page 98 Chapter 6: How Cells Harvest Chemical Energy 6.3 Cellular respiration banks energy in ATP molecules Page 109 Figure 6.3 Summary equation for cellular respiration Page 109
		FB.3.6 Compare and contrast the processes and results of mitosis and meiosis.	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.4 The cell cycle includes growth and division phases Page 150 8.5 Cell division is a continuum of dynamic changes Page 151

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			8.13 Meiosis reduces the chromosome number from diploid to haploid Page 159 8.14 VISUALIZING THE CONCEPT Mitosis and meiosis have important similarities and differences Page 160
		FB.3.7 Enrichment: Research and orally communicate the possible outcomes of a failure of mitosis (cancer) or meiosis (nondisjunction).	Chapter 8: The Cellular Basis of Reproduction and Inheritance 8.0 Cancer is caused by too much cell division Page 146 8.18 Accidents during meiosis can alter chromosome number Page 164
FB.4 Molecular Basis of Heredity	FB.4 Students will demonstrate an understanding of how genetic information is transferred from parent to offspring.	FB.4.1 Compare and contrast the basic structure and function of nucleic acids (e.g., DNA, RNA).	Chapter 3: The Molecules of Cells Nucleic Acids 3.15 The nucleic acids DNA and RNA are information-rich polymers of nucleotides Page 55
		FB.4.2 Obtain and communicate information illustrating the relationships	Chapter 3: The Molecules of Cells Nucleic Acids

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
		among DNA, genes, chromosomes, and proteins to the basis of life.	3.13 Proteins are made from amino acids linked by peptide bonds Page 53 3.15 The nucleic acids DNA and RNA are information-rich polymers of nucleotides Page 55 Figure 3.15A A nucleotide Page 55 Figure 3.15D The flow of genetic information in the building of a protein Page 55 Chapter 4: A Tour of the Cell The Nucleus and Ribosomes 4.5 The nucleus contains the cell's genetic instructions Page 65 4.6 Ribosomes make proteins for use in the cell and for export Page 66

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Chapter 10: Molecular Biology of the Gene 10.1 Experiments showed that DNA is the genetic material Page 201 10.6 Genes control phenotypic traits through the expression of proteins Page 206 10.7 Genetic information written in codons is translated into amino acid sequences Page 207
		FB.4.3 Use models (e.g., Punnett squares) and mathematical reasoning to describe and predict patterns of inheritance of single genetic traits from parents to offspring (e.g., dominant, and recessive traits, incomplete dominance, codominance, multiple alleles, sex-linkage).	Chapter 9: Patterns of Inheritance 9.3 Mendel's law of segregation describes the inheritance of a single character Page 176 Figure 9.3A A cross that tracks one character (flower color) Page 176 Figure 9.3B An explanation of the crosses in Figure 9.3A Page 176

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			9.4 Homologous chromosomes bear the alleles for each character Page 177 Figure 9.4 Three gene loci on homologous chromosomes Page 177 9.9 Many inherited traits in humans are controlled by a single gene Page 182 Figure 9.9A Examples of single-gene inherited traits in humans Page 182 Figure 9.9B Offspring produced by parents who are both carriers for albinism, a recessive disorder Page 182 9.11 Incomplete dominance results in intermediate phenotypes Page 184

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			9.12 Many genes have more than two alleles that may be codominant Page 185 Figure 9.12 Multiple alleles for the ABO blood groups Page 185 9.21 Sex-linked genes exhibit a unique pattern of inheritance Page 194 Figure 9.21A Fruit fly eye color determined by sex-linked gene Page 194 Figure 9.21C A heterozygous female crossed with a red-eyed male Page 194
		FB.4.4 Obtain and communicate information to describe how mutations may affect genetic expression and provide examples.	Chapter 10: Molecular Biology of the Gene 10.6 Mutations Can Affect Genes Figure 10.16A The molecular basis of sickle-cell disease Page 216

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
		FB.4.5 Research and report genetic technologies that may improve the quality of life (e.g., genetic engineering, cloning, gene splicing, DNA testing).	Chapter 10: Molecular Biology of the Gene 10.23 Bacterial plasmids can serve as carriers for gene transfer Page 223 Chapter 12: DNA Technology and Genomics Gene Cloning and Editing (12.1–12.5) Page 250-254 Genetically Modified Organisms (12.6–12.10) Page 255-259 12.15 DNA profiling has provided evidence in many forensic investigations Page 264
		FB.4.6 Enrichment: Debate the pros and cons of using biotechnology to manipulate genetic information for human purpose (society).	Chapter 12: DNA Technology and Genomics 12.9 The use of genetically modified organisms raises questions and concerns Page 258 Human Safety Page 258
FB.5 Biological Evolution	FB.5 Students will demonstrate an understanding of Earth’s fossil	FB.5.1 Investigate through research the contributions of scientists to the theory of evolution and evolutionary processes	Chapter 13: How Populations Evolve Darwin’s Theory of Evolution (13.1–13.7) Page 276 -282

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
	record and its indication of the diversity of life over time.	(e.g., Needham, Spallanzani, Redi, Pasteur, Lyell, Lamarck, Malthus, Wallace, Darwin).	Figure 14.9A Peter and Rosemary Grant collecting data on medium ground finches on Daphne Major Page 306 Chapter 15: Tracing Evolutionary History 15.2 Experiments show that the abiotic synthesis of organic molecules is possible Page 314
		FB.5.2 Analyze and interpret data to support claims that different types of fossils provide evidence of the diversity of life that has existed on Earth and of the relationships between past and existing life on Earth.	Chapter 15: Tracing Evolutionary History 15.5 The actual ages of rocks and fossils mark geologic time Page 317 15.6 The fossil record documents the history of life Page 318 Table 15.6 The Geologic Record Page 318 15.9 Five mass extinctions have altered the course of evolution Page 321

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			15.10 Adaptive radiations have increased the diversity of life Page 322
		FB.5.3 Obtain and communicate information to explain how DNA evidence and fossil records support Darwin's theory of evolution.	Chapter 12: DNA Technology and Genomics 12.21 Genomes hold clues to human evolution Page 270 Chapter 13: How Populations Evolve 13.2 The study of fossils provides strong evidence for evolution Page 277 13.3 Fossils of transitional forms support Darwin's theory of evolution Page 278 13.4 Homologies provide strong evidence for evolution Page 279
		FB.5.4 Investigate how biological adaptations and genetic variations of traits in a population enhance the probability of survival in an environment (natural selection).	Chapter 13: How Populations Evolve 13.6 Darwin proposed natural selection as the mechanism of evolution Page 281

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			13.7 Scientists can observe natural selection in action Page 282 The Evolution of Populations 13.8 Mutation and sexual reproduction produce the genetic variation that makes evolution possible Page 283 Genetic Variation Page 283 Figure 13.8 Variation in a population of brown-lipped snails Page 283
		FB.5.5 Enrichment: Create and analyze models that illustrate the relatedness between all living things (cladograms/phylogenic trees).	Chapter 15: Tracing Evolutionary History 15.15 Phylogenies based on homologies reflect evolutionary history Page 327 15.16 Shared characters are used to construct phylogenetic trees Page 328

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Cladistics Page 328 Figure 15.16A Constructing a phylogenetic tree using cladistics Page 328 Figure 15.16B A phylogenetic tree of reptiles (* indicates extinct lineages) Page 328
FB.6 Ecological Principals	FB.6 Students will understand the interdependence of living organisms and their environment.	FB 6.1 Compare and contrast biotic and abiotic factors.	Chapter 34: The Biosphere: An Introduction to Earth's Diverse Environments The Biosphere 34.1 Ecologists study how organisms interact with their environment at several levels Page 693 34.3 Physical and chemical factors influence life in the biosphere Page 695 34.4 Organisms are adapted to abiotic and biotic factors through natural selection Page 696

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
		FB 6.2 Use models to analyze the cycling of matter in an ecosystem (e.g., water, carbon dioxide/oxygen, nitrogen).	Chapter 34: The Biosphere: An Introduction to Earth's Diverse Environments 34.18 VISUALIZING THE CONCEPT The global water cycle connects aquatic and terrestrial biomes Page 710 Video: Visualizing the Concept: The global water cycle connects aquatic and terrestrial biomes Page 710 Checkpoint 34.18 What is the main way that living organisms contribute to the water cycle? Page 710 Chapter 37: Communities and Ecosystems 37.19 The carbon cycle depends on photosynthesis and respiration Page 775 Figure 37.19 The carbon cycle Page 775

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			37.20 The phosphorus cycle depends on the weathering of rock Page 776 Figure 37.20 The phosphorus cycle Page 776 37.21 The nitrogen cycle depends on bacteria Page 777 Figure 37.21 The nitrogen cycle Page 777
		FB.6.3 Obtain, evaluate, and communicate information to explain relationships that exist between abiotic and biotic components of an ecosystem. Explain how changes in biotic and abiotic components affect the balance of an ecosystem over time.	Chapter 34: The Biosphere: An Introduction to Earth's Diverse Environments 34.3 Physical and chemical factors influence life in the biosphere Page 695 34.18 VISUALIZING THE CONCEPT The global water cycle connects aquatic and terrestrial biomes Page 710 Chapter 37: Communities and Ecosystems

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			37.12 Disturbance is a prominent feature of most communities Checkpoint 37.12 What is the main abiotic factor that distinguishes primary from secondary succession? Page 768 37.13 Invasive species can devastate communities Checkpoint 37.13 What distinguishes invasive species from organisms that are introduced to non-native habitats but do not become invasive? Page 769 37.14 Ecosystem ecology emphasizes energy flow and chemical cycling Checkpoint 37.14 How do chemical cycles in an ecosystem differ from food chains in a community? Page 770 37.18 Chemicals are cycled between organic matter and abiotic reservoirs

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Checkpoint 37.18 Which boxes in Figure 37.18 represent biotic components of an ecosystem? Page 774 37.22 A rapid inflow of nutrients degrades aquatic ecosystems Checkpoint 37.22 How would excessive addition of mineral nutrients to a lake eventually lead to the loss of many fish species? Page 778
		FB 6.4 Develop and use models to discuss the climate, flora, and fauna of the terrestrial and aquatic biomes of the world.	Chapter 34: The Biosphere: An Introduction to Earth's Diverse Environments 34.5 Regional climate influences the distribution of terrestrial communities Page 697 Figure 34.5A How solar radiation varies with latitude Page 697 Figure 34.5B How Earth's tilt causes the seasons Page 697

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Aquatic Biomes 34.6 Sunlight and substrate are key factors in the distribution of marine organisms Page 698 Figure 34.6A Ocean life (zone depths and size of organisms not drawn to scale) Page 698 Checkpoint 34.6 Oil from the 2010 Deepwater Horizon disaster in the Gulf of Mexico has polluted estuaries in Louisiana. Why does this pollution affect other animals in addition to those that live permanently in the estuaries? Page 698 34.7 Current, sunlight, and nutrients are important abiotic factors in freshwater biomes Page 699 Terrestrial Biomes 34.8 Terrestrial biomes reflect regional variations in climate Page 700

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards Total Standards: 6			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			34.9 to 34.17 Page 701 to 709 (Tropical forests, savanna grasslands, temperate grasslands, temperate forests, coniferous forests, tundra)
		FB 6.5 Use models to analyze the flow of energy through food chains, webs, and pyramids.	Chapter 37: Communities and Ecosystems 37.8 Trophic structure is a key factor in community dynamics Figure 37.8 Two food chains Page 764 Checkpoint 37.8 I'm eating a cheese pizza. At which trophic level(s) am I feeding? Page 764 37.9 VISUALIZING THE CONCEPT Food chains interconnect, forming food webs Page 765 Checkpoint 37.9 In addition to grasshoppers, the collared lizard shown in the middle of the figure may also eat smaller lizards, which in turn feed on grasshoppers and ants. What trophic levels does the collared lizard occupy

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			when its diet includes smaller lizards as well as grasshoppers? Page 765 37.16 Energy supply limits the length of food chains Page 772 Figure 37.16A The fate of the energy in leaf biomass consumed by a caterpillar Page 772 Figure 37.16B An idealized energy pyramid Page 772
		FB 6.6 Engage in scientific argument from evidence to distinguish organisms that exist in symbiotic (mutualism, parasitism, commensalism) or co-evolutionary (predator-prey, cooperation, competition, and mimicry) relationships within ecosystems.	Chapter 37: Communities and Ecosystems 37.2 Interspecific interactions are fundamental to community structure Page 758 37.3 Competition may occur when a shared resource is limited Page 759

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Checkpoint 37.3 Which do you think has more severe effects, intraspecific competition or interspecific competition? Explain why. Page 759 37.4 Mutualism benefits both partners Page 760 Checkpoint 37.4 When corals are stressed by environmental conditions, they expel their dinoflagellates in a process called bleaching. How is widespread bleaching likely to affect coral reefs? Page 760 37.5 Predation leads to diverse adaptations in prey species Page 761 Checkpoint 37.5 Explain why predation is a powerful factor in the adaptive evolution of prey species. Page 761

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			37.7 Parasites and pathogens can affect community composition Page 763 Checkpoint 37.7 Use your knowledge of interspecific interactions to explain why tree diversity increased after all the chestnuts died. Page 763
		FB 6.7 Enrichment: Design solutions to reduce the impact of human activity on the ecosystem.	Chapter 37: Communities and Ecosystems 37.17 An energy pyramid explains the ecological cost of meat Page 773 Figure 37.17 Food energy available to people eating at different trophic levels Page 773 Chapter 38: Conservation Biology Conservation Biology and Restoration Ecology 38.7 Protecting endangered populations is one goal of conservation biology Page 790

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Checkpoint 38.7 What do you think is the first priority for conservation biologists when they select a site for ferret reintroduction? Page 790 38.8 Sustaining ecosystems and landscapes is a conservation priority Page 791 38.9 Establishing protected areas slows the loss of biodiversity Page 792 38.10 Zoned reserves are an attempt to reverse ecosystem disruption Page 793 38.11 The Yellowstone to Yukon Conservation Initiative seeks to preserve biodiversity by connecting protected areas Page 794 38.12 The study of how to restore degraded habitats is a developing science Page 795

2018 Mississippi College- and Career-Readiness Standards for Science			
Book: Campbell, Biology: Concepts & Connections 10th edition, ©2021			
Foundations of Biology Standards **Total Standards: 6**			
Disciplinary Core Idea	**Content Standard**	**Breakout**	**Citations**
			Checkpoint 38.12 How will the Kissimmee River Restoration Project improve water quality in the Everglades ecosystem? Page 795 38.13 Sustainable development is an ultimate goal Page 796 Checkpoint 38.13 Why is a concern for the well-being of future generations essential for progress toward sustainable development? Page 796

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
HAP.1 Physiological Functions/Anatomical Structure	Anatomists have developed a universal set of reference terms that aid in the identification of body structures with a high degree of specificity. Body organization from simple to complex levels and an introduction to the organ systems forming the body lead to a higher understanding of anatomical structures in the human body.	HAP.1 Students will demonstrate an understanding of how anatomical structures and physiological functions are organized and described using anatomical position.	HAP.1.1 Apply appropriate anatomical terminology when explaining the orientation of regions, directions, and body planes or sections.	1: The Human Body: An Orientation 1.5 Anatomical terms describe body directions, regions, and planes Page no. 12 Anatomical Position and Directional Terms Page no. 12 Figure 1.8 Regional terms used to designate specific body areas. Page no. 13 6: Bones and Skeletal Tissues 6.1 Hyaline, elastic, and fibrocartilage help form the skeleton Page no. 174 9: Muscles and Muscle Tissue 9.2 A skeletal muscle is made up of muscle fibers, nerves, blood vessels, and connective tissues Page no. 281 Self-Check: Section 9.2 Q. 2, 3 Page no. 284 20: The Lymphatic System and Lymphoid Organs and Tissues 20.1 The lymphatic system includes lymphatic vessels, lymph, and lymph nodes Page no. 768

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.1.2 Locate organs and their applicable body cavities and systems.	12: The Central Nervous System 12.1 Folding during development determines the complex structure of the adult brain Page no. 433 18: The Cardiovascular System: The Heart 18.1 The heart has four chambers and pumps blood through the pulmonary and systemic circuits Page no. 671 22: The Respiratory System Part 1 Functional Anatomy Figure 22.2 **The major respiratory organs in relation to surrounding structures.** Page no. 824
			HAP.1.3 Investigate the interdependence of the various body systems to each other and to the body as a whole.	1: The Human Body: An Orientation 1.1 Form (anatomy) determines function (physiology) Page no. 2 1.2 The body's organization ranges from atoms to the entire organism Page no. 4 1.3 What are the requirements for life? Figure 1.3 Examples of interrelationships among body organ systems. Page no. 5 Figure 1.4 The body's organ systems and their major functions Page no. 6

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards Total Standards: 14				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
HAP.2 Cells and Tissues	The smallest structural and functional unit of the human body is the cell. The cell is composed of organelles that perform varied but specific functions. Cells within the human body can metabolize, digest foods, dispose of waste, reproduce, grow, move, and respond to stimuli. Groups of cells that are similar in structure and function form the four types of tissues (epithelial, connective, nervous, and muscle) found in the human body.	HAP.2 Students will demonstrate an understanding of the relationship of cells and tissues that form complex structures of the body.	HAP.2.1 Analyze the characteristics of the four main tissue types: epithelial, connective, muscle, and nervous. Examine tissues using microscopes and other various technologies.	4: Tissue: The Living Fabric 4.1 Tissue samples are fixed, sliced, and stained for microscopy Page no. 117 4.2 Epithelial tissue covers body surfaces, lines cavities, and forms glands Page no. 117 4.3 Connective tissue is the most abundant and widely distributed tissue in the body Page no. 126 4.4 Muscle tissue is responsible for body movement Page no. 138 4.5 Nervous tissue is a specialized tissue of the nervous system Page no. 140
			HAP.2.2 Construct a model to demonstrate how the structural organization of cells in a tissue relates to the	4: Tissue: The Living Fabric Figure 4.4 Epithelial tissues. Page no. 119-120 Table 4.1

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			specialized function of that tissue.	**Comparison of Classes of Connective Tissues** Page no. 126 Figure 4.12 Muscle tissues. Page no. 138 Figure 4.13 Nervous tissue. Page no. 140
			HAP.2.3 Enrichment: Use an engineering design process to research and develop medications (i.e., targeted cancer therapy drugs) that target uncontrolled cancer cell reproduction.*	3: Cells: The Living Units 3.11 The cell cycle consists of interphase and a mitotic phase Control of Cell Division Page no. 98 3.13 Autophagy and proteasomes dispose of unneeded organelles and proteins; apoptosis disposes of unneeded cells Page no. 109 Check Your Understanding: Section 3.13 Q. 34 Page no. 109 Chapter 3: Review Questions Q. 19 Page no. 113
HAP.3 Integumentary System	The integumentary system is composed of epithelial membranes (i.e., skin epidermis, mucosae, and serosae). The connective-tissue synovial membranes	HAP.3 Students will investigate the structures and functions of the integumentary system,	HAP.3.1 Identify structures and explain the functions of the integumentary system, including layers of skin, accessory structures, and types of membranes.	5: The Integumentary System Introduction Page no. 150 5.1 The skin consists of two layers: the epidermis and dermis Figure 5.1 **Skin structure.** Page no. 151

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	cover, insulate, protect, and cushion body organs as well as the entire body. The integumentary system is critical to maintaining homeostasis using internal and external regulators.	including the cause and effect of diseases and disorders.		5.2 The epidermis is a keratinized stratified squamous epithelium Page no. 152 Layers of the Epidermis Page no. 153 Self-Check: Section 5.2 Page no. 154 5.3 The dermis consists of papillary dermis and reticular dermis Page no. 154 5.4 Melanin, carotene, and hemoglobin determine skin color Page no. 156 5.5 to 5.7 Page no. 157 to 163 (Hair, Nail, sweat glands) 5.8 First and foremost, the skin is a barrier Page no. 163
			HAP.3.2 Investigate specific mechanisms (e.g., feedback and temperature regulation) through which the skin maintains homeostasis.	5: The Integumentary System System Connections Homeostatic Interrelationships between the Integumentary System and Other Body Systems Page no. 169 Q. 19 Page no. 172
			HAP.3.3 Research and analyze the causes and effects of	5: The Integumentary System

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			various pathological conditions (e.g., burns, skin cancer, bacterial/viral infections, and chemical dermatitis).	5.9 Skin cancer and burns are major challenges to the body (Clinical) Page no. 165 Chapter 5: Related Clinical Terms Page no. 169 (includes infections and other skin conditions)
			HAP.3.4 Enrichment: Use an engineering design process to design and model/simulate effective treatments for skin disorders (e.g., tissue grafts).*	5: The Integumentary System 5.9 Skin cancer and burns are major challenges to the body (Clinical) Page no. 165 Treating Burns Page no. 167 Q. 25 Page no. 172 Clinical Case Study 21-Year-Old Female with Deep Lacerations Page no. 172
HAP.4 Skeletal System	The skeletal system is composed of cartilage and bone. Together these supportive tissues form the framework for the	HAP.4 Students will investigate the structures and functions of the skeletal system including	HAP.4.1 Use models to compare the structure and function of the skeletal system.	6: Bones and Skeletal Tissues 6.1 Hyaline, elastic, and fibrocartilage help form the skeleton Page no. 174 Figure 6.1 The bones and cartilages of the human skeleton. Page no. 174

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	body. The skeletal system encloses organs, attaches skeletal muscles, and connects bone, forming joints to aid in movement.	the cause and effect of diseases and disorders.		6.2 Bones perform several important functions Page no. 175 Self-Check: Section 6.2 3. Which of the following is a function of red bone marrow? Page no. 176
			HAP.4.2 Develop and use models to identify and classify major bones as part of the appendicular or axial skeleton.	6: Bones and Skeletal Tissues 6.3 Bones are classified by their location and shape Figure 6.2 Classification of bones on the basis of shape. Page no. 176 Check Your Understanding: Section 6.1 6. What are the components of the axial skeleton? 7. Contrast the general function of the axial skeleton to that of the appendicular skeleton. 8. What bone class do the ribs and skull bones fall into? Page no. 176
			HAP.4.3 Identify and classify types of joints and their movement.	8: Joints 8.1 Joints are classified into three structural and three functional categories Page no. 251

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Table 8.1 Summary of Joint Classes Page no. 252 Check Your Understanding: Section 8.1 1. What functional joint class contains the least-mobile joints? 2. How are joint mobility and stability related? Page no. 252 Self-Check: Section 8.1 1. Which of the following is a functional classification of joints that have the least mobility? Page no. 252
			HAP.4.4 Demonstrate an understanding of the growth and development of the skeletal system, differentiating between endochondral and intramembranous ossification.	6: Bones and Skeletal Tissues 6.5 Bones develop either by intramembranous or endochondral ossification Page no. 184 Figure 6.9 Endochondral ossification in a long bone. Page no. 185 Figure 6.10 Intramembranous ossification. Page no. 186 Figure 6.11 Growth in length of a long bone occurs at the epiphyseal plate. Page no. 186

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Figure 6.12 Long bone growth and remodeling during youth. Page no. 187 Check Your Understanding: Section 6.5 Page no. 188 Self-Check: Section 6.5 Page no. 188
			HAP.4.5 Construct explanations detailing how mechanisms (e.g., Ca2+ regulation) are used by the skeletal system to maintain homeostasis.	6: Bones and Skeletal Tissues 6.6 Bone remodeling involves bone deposition and removal Page no. 188 Control of Remodeling Page no. 189 Figure 6.13 Parathyroid hormone (PTH) control of blood calcium levels. Page no. 189 Level 1 Remember/Understand Q. 6 Page no. 197 Q. 19 Page no. 198
			HAP.4.6 Research and analyze various pathological conditions (e.g., bone fractures, osteoporosis, bone cancers, various types of arthritis, and carpal tunnel syndrome).	6: Bones and Skeletal Tissues 6.8 Bone disorders result from abnormal bone deposition and resorption (Clinical) Page no. 193 Chapter 6: Related Clinical Terms Page no. 196 8: Joints

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				8.6 Joints are easily damaged by injury, inflammation, and degeneration (Clinical) Check Your Understanding: Section 8.6 Page no. 275 Self-Check: Section 8.6 Page no. 275
			HAP.4.7 Enrichment: Use an engineering design process to develop, model, and test effective treatments for bone disorders (i.e., prosthetics).*	8: Joints A Closer Look (Clinical) Joints: From Knights in Shining Armor to Bionic Humans Page no. 274 A hip prosthesis. Page no. 274
HAP.5 Muscular System	The muscular system, with the aid of three types of muscle tissue (skeletal, cardiac, and smooth), provides movement, contour and shape, joint stability, heat generation, and the transportation of materials throughout the body.	HAP.5 Students will investigate the structures and functions of the muscular system, including the cause and effect of diseases and disorders.	HAP.5.1 Develop and use models to illustrate muscle structure, muscle locations and groups, actions, origins, and insertions.	9: Muscles and Muscle Tissue 9.1 There are three types of muscle tissue Page no. 280 Check Your Understanding: Section 9.1 Page no. 281 9.2 A skeletal muscle is made up of muscle fibers, nerves, blood vessels, and connective tissues Page no. 281 Figure 9.1 Connective tissue sheaths of skeletal muscle: epimysium, perimysium, and endomysium. (b) Photomicrograph of a cross section of part of a skeletal muscle (30×). Page no. 282

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Table 9.1 Structure and Organizational Levels of Skeletal Muscle Page no. 283 Attachments Page no. 283 Check Your Understanding: Section 9.2 Page no. 284 Self-Check: Section 9.2 Page no. 284 10: The Muscular System 10.5 A muscle's attachments determine its action Page no. 332
			HAP.5.2 Describe the structure and function of the skeletal muscle fiber and the motor unit.	9: Muscles and Muscle Tissue 9.3 Skeletal muscle fibers contain calcium-regulated molecular motors Page no. 285 Figure 9.2 Microscopic anatomy of a skeletal muscle fiber. Page no. 285 Figure 9.3 Composition of thick and thin filaments. Page no. 286 Figure 9.5 **Relationship of the sarcoplasmic reticulum and T tubules to myofibrils of skeletal muscle.** Page no. 288 Figure 9.6

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Sliding filament model of contraction Page no. 289 9.4 Motor neurons stimulate skeletal muscle fibers to contract Page no. 290 Anatomy of Motor Neurons and the Neuromuscular Junction Page no. 290 Figure 9.7 Overview of skeletal muscle contraction. Page no. 291 9.5 Temporal summation and motor unit recruitment allow smooth, graded skeletal muscle contractions Page no. 299 The Motor Unit Page no. 299 Figure 9.11 A motor unit consists of one motor neuron and all the muscle fibers it innervates. Page no. 299
			HAP.5.3 Explain the molecular mechanism of muscle contraction and relaxation.	9: Muscles and Muscle Tissue 9.4 Motor neurons stimulate skeletal muscle fibers to contract Page no. 290 Anatomy of Motor Neurons and the Neuromuscular Junction Page no. 290 Figure 9.7 Overview of skeletal muscle contraction. Page no. 291

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Events at the Neuromuscular Junction Page no. 293 Events at the Neuromuscular Junction A&P Flix Video Page no. 293 The Neuromuscular Junction IP2 Video Page no. 293 Figure 9.8 **Summary of events in the generation and propagation of an action potential in a skeletal muscle fiber.** Page no. 293 Focus Figure 9.2 Excitation-Contraction Coupling Page no. 296
			HAP.5.4 Use models to locate the major muscles and investigate the movements controlled by each muscle.	9: Muscles and Muscle Tissue 9.1 There are three types of muscle tissue Page no. 280 9.9 Smooth muscle is nonstriated involuntary muscle Page no. 310 Figure 9.23 Arrangement of smooth muscle in the walls of hollow organs. Page no. 310 Table 9.3 Comparison of Skeletal, Cardiac, and Smooth Muscle Page no. 311 10: The Muscular System

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				10.1 For any movement, muscles can act in one of three ways Page no. 324 10.4 Muscles acting with bones form lever systems Page no. 327 10.5 A muscle's attachments determine its action Page no. 332 Figure 10.4 Superficial muscles of the body: Anterior view. Page no. 332
			HAP.5.5 Compare and contrast the anatomy and physiology of the three types of muscle tissue.	9: Muscles and Muscle Tissue 9.9 Smooth muscle is nonstriated involuntary muscle Page no. 310 Table 9.3 Comparison of Skeletal, Cardiac, and Smooth Muscle Page no. 311 Differences between Smooth and Skeletal Muscle Fibers Page no. 311
			HAP.5.6 Use technology to plan and conduct an investigation that demonstrates the physiology of muscle contraction, muscle fatigue, or muscle tone.	9: Muscles and Muscle Tissue 9.4 Motor neurons stimulate skeletal muscle fibers to contract Figure 9.7 Page no. 290 Overview of skeletal muscle contraction. Page no. 291

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			Collect and analyze data to interpret results, then explain and communicate conclusions.	Events at the Neuromuscular Junction A&P Flix Video Page no. 293 The Neuromuscular Junction IP2 Video Page no. 293 9.5 Temporal summation and motor unit recruitment allow smooth, graded skeletal muscle contractions Graded Muscle Contractions Page no. 300 Figure 9.13 Temporal summation. Page no. 300 Muscle Tone Page no. 303 Isotonic and Isometric Contractions Page no. 303 Check Your Understanding: Section 9.5 Q. 14, 15 Page no. 303 9.9 Smooth muscle is nonstriated involuntary muscle Page no. 310 Contraction of Smooth Muscle Page no. 314 Chapter 9: Review Questions Level 3 Evaluate/Synthesize Q. 26 Page no. 321 10: The Muscular System Chapter 10: Review Questions Q. 25 Page no. 388

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.5.7 Research and analyze the causes and effects of various pathological conditions, (e.g., fibromyalgia, muscular dystrophy, cerebral palsy, muscle cramps/strains, and tendonitis).	9: Muscles and Muscle Tissue Chapter 9: Related Clinical Terms Page no. 319 Clinical Case Study Children with Muscular Disorders Page no. 322 10: The Muscular System Chapter 10: Related Clinical Terms Page no. 386
			HAP.5.8 Enrichment: Use an engineering design process to develop effective ergonomic devices to prevent muscle fatigue and strain (e.g., carpal tunnel, exoskeletons for paralysis, or training plans to prevent strains/sprains/cramps).*	10: The Muscular System Chapter 10: Review Questions Q. 22, 23, 24, 25 Page no. 388
HAP.6 Nervous System	The nervous system is composed of the central nervous system and the peripheral nervous system. These divisions work together to create every thought, action,	HAP. 6 Students will investigate the structures and functions of the nervous system, including the cause and effect of diseases and disorders.	HAP.6.1 Describe and evaluate how the nervous system functions and interconnects with all other body systems.	11: Fundamentals of the Nervous System and Nervous Tissue 11.1 The nervous system receives, integrates, and responds to information Figure 11.1 The nervous system's functions. Page no. 391

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	and sensation that occurs within the body. The exploration of the special senses will provide an understanding of sight, hearing, smell, and taste.			Figure 11.3 Organization of the nervous system. Page no. 392 14: The Autonomic Nervous System System Connections Homeostatic Interrelationships between the Nervous System and Other Body Systems Page no. 549
			HAP.6.2 Analyze the structure and function of neurons and their supporting neuroglia cells (e.g. astrocytes, oligodendrocytes, Schwann cells, microglial).	11: Fundamentals of the Nervous System and Nervous Tissue 11.2 Neuroglia support and maintain neurons Page no. 393 Figure 11.4 Neuroglia. Page no. 393 Neuroglia in the CNS Page no. 393 Neuroglia in the PNS Page no. 394 11.3 Neurons are the structural units of the nervous system Page no. 394 Table 11.2 Comparison of Structural Classes of Neurons Page no. 398 Check Your Understanding: Section 11.3 Page no. 400

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards Total Standards: 14				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Self-Check: Section 11.3 Page no. 400
			HAP.6.3 Discuss the structure and function of the brain and spinal cord.	12: The Central Nervous System 12.1 Folding during development determines the complex structure of the adult brain Page no. 433 Brain Regions and Organization Page no. 434 12.2 to 12.4 (Structure of brain and its parts. Page no. 437 to 452 12.5 to 12. 7 (Functions of different parts of the brain) Page no. 453 to 462 12.10 The spinal cord is a reflex center and conduction pathway Page no. 468 Spinal Cord Cross-Sectional Anatomy Page no. 470
			HAP.6.4 Compare and contrast the structures and functions of the central and peripheral nervous systems. Investigate how the systems interact to maintain homeostasis (e.g., reflex responses, sensory responses).	12: The Central Nervous System 12.11 Neuronal pathways carry sensory and motor information to and from the brain Page no. 474 13: The Peripheral Nervous System and Reflex Activity 13.1 Sensory receptors are activated by changes in the internal or external environment Page no. 488

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				3.2 Receptors, ascending pathways, and cerebral cortex process sensory information Page no. 491 13.8 The reflex arc enables rapid and predictable responses Page no. 517 Components of a Reflex Arc Page no. 517
			HAP.6.5 Enrichment: Plan and conduct an experiment to test reflex response rates under varying conditions. Using technology, construct graphs in order to analyze and interpret data to explain and communicate conclusions.	13: The Peripheral Nervous System and Reflex Activity Chapter 13: Review Questions Q. 27, 28 Page no. 528
			HAP.6.6 Describe the major characteristics of the autonomic nervous system. Contrast the roles of the sympathetic and parasympathetic nervous systems in maintaining homeostasis.	14: The Autonomic Nervous System 14.1 The ANS differs from the somatic nervous system in that it can excite or inhibit its effectors Page no. 530 14.2 The ANS consists of the parasympathetic and sympathetic divisions Page no. 534 14.7 The parasympathetic and sympathetic divisions usually produce opposite effects Page no. 544

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.6.7 Describe the structure and function of the special senses (i.e., vision, hearing, taste, and olfaction).	15: The Special Senses Part 1 The Eye and Vision Page no. 554 to 574 Part 2 The Chemical Senses: Smell and Taste Page no. 575 to 579 Part 3 The Ear: Hearing and Balance Page no. 580 to 595
			HAP.6.8 Research and analyze the causes and effects of various pathological conditions (e.g., addiction, depression, schizophrenia, Alzheimer's, sports-related chronic traumatic encephalopathy [CTE], dementia, chronic migraine, stroke, and epilepsy).	11: Fundamentals of the Nervous System and Nervous Tissue Chapter 11: Related Clinical Terms Page no. 428 Clinical Case Study Nursing Student with Neuropathic Pain Page no. 431 12: The Central Nervous System Chapter 12: Related Clinical Terms Page no. 482 Clinical Case Study 39-Year-Old Female with Traumatic Brain Injury Page no. 486 13: The Peripheral Nervous System and Reflex Activity Chapter 13: Related Clinical Terms Page no. 524

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Clinical Case Study 44-Year-Old Male with Skull Fracture Page no. 528 14: The Autonomic Nervous System Chapter 14: Related Clinical Terms Page no. 549 Clinical Case Study 10-Year-Old Boy with Spinal Injury Page no. 552 15: The Special Senses Chapter 15: Related Clinical Terms Page no. 596 Clinical Case Study 32 -Year-Old Male with Recurring Vertigo Page no. 600
			HAP.6.9 Enrichment: Use an engineering design process to develop, model, and test preventative devices for neurological injuries and/or disorders (e.g., concussion-proof helmets or possible medications for addiction and depression).*	13: The Peripheral Nervous System and Reflex Activity Chapter 13: Review Questions Q. 30, 31 Page no. 528 Clinical Case Study 44-Year-Old Male with Skull Fracture Page no. 528 14: The Autonomic Nervous System Chapter 14: Review Questions

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Q. 15, 16 Page no. 551 Clinical Case Study 10-Year-Old Boy with Spinal Injury Page no. 552
HAP.7 Endocrine System	The endocrine system, using hormones, gives instructions that control growth and development, reproductive capabilities, and the physiological homeostasis of the body systems.	HAP.7 Students will demonstrate an understanding of the major organs of the endocrine system and the associated hormonal production and regulation.	HAP.7.1 Obtain, evaluate, and communicate information to illustrate that the endocrine glands secrete hormones that help the body maintain homeostasis through feedback mechanisms.	16: The Endocrine System Figure 16.7 Regulation of thyroid hormone secretion. Page no. 616 16.7 The thyroid gland controls metabolism Transport and Regulation Page no. 620 System Connections Homeostatic Interrelationships between the Endocrine System and Other Body Systems Page no. 637
			HAP.7.2 Discuss the function of each endocrine gland and the various hormones secreted.	16: The Endocrine System 16.6 The hypothalamus controls release of hormones from the pituitary gland in two different ways

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				to 16.11 The pancreas, gonads, and most other organs secrete hormones Page no. 609 -636
			HAP.7.3 Model specific mechanisms through which the endocrine system maintains homeostasis (e.g., insulin/glucagon and glucose regulation; T3 / T4 and metabolic rates; calcitonin/parathyroid and calcium regulation; antidiuretic hormone and water balance; growth hormone; and cortisol and stress).	16: The Endocrine System Focus Figure 16.1 Hypothalamus and Pituitary Interactions Page no. 609 Table 16.3 Pituitary Hormones: Summary of Regulation and Effects Page no. 609 Figure 16.7 Regulation of thyroid hormone secretion. Page no. 616 Table 16.5 Adrenal Gland Hormones: Summary of Regulation and Effects Page no. 622 Figure 16.12 Effects of parathyroid hormone on bone, the kidneys, and the intestine. Page no. 622 Figure 16.14 Major mechanisms controlling aldosterone release. Page no. 624 Figure 16.17

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Insulin and glucagon from the pancreas regulate blood glucose levels. Page no. 630 Homeostasis: Regulating Blood Sugar BioFlix Video Page no. 630 Figure 16.18
			HAP.7.4 Research and analyze the effects of various pathological conditions (e.g., diabetes mellitus, pituitary dwarfism, Graves' disease, Cushing's syndrome, hypothyroidism, and obesity).	16: The Endocrine System 16.6 The hypothalamus controls release of hormones from the pituitary gland in two different ways Antidiuretic Hormone (ADH) Page no. 613 Homeostatic Imbalance 16.2 (Clinical) Page no. 615 Homeostatic Imbalance 16.4 (Clinical) Page no. 620 Homeostatic Imbalance 16.5 (Clinical) Page no. 622 Homeostatic Imbalance 16.7 (Clinical) Page no. 625 Consequences of insulin deficit (diabetes mellitus). Page no. 631
			HAP.7.5 Enrichment: Use an engineering design process to develop effective treatments for endocrine disorders (e.g.,	16: The Endocrine System Chapter 16: Review Questions Level 3 Evaluate/Synthesize Q. 20 to Q. 26 Page no. 641

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			methods to regulate hormonal imbalance).*	
HAP.8 Male and Female Reproductive Systems	The reproductive system's biological function is to generate offspring for the continuance of our species. Interactions of the egg and sperm, the biological clock, and fertility play critical roles in the production of an offspring. Proper embryonic development directly depends on the health of the reproductive system.	HAP. 8 Students will investigate the structures and functions of the male and female reproductive system, including the cause and effect of diseases and disorders.	HAP.8.1 Compare and contrast the structure and function of the male and female reproductive systems.	27: The Reproductive System 27.1 The male and female reproductive systems share common features Page no. 1050 Part 1 Anatomy of the Male Reproductive System Page no. 1056 Part 3 Anatomy of the Female Reproductive System Page no. 1071
			HAP.8.2 Describe the male reproductive anatomy and relate structure to sperm production and release.	27: The Reproductive System Part 1 Anatomy of the Male Reproductive System Page no. 1056 27.2 The testes are enclosed and protected by the scrotum Page no. 1056 27.3 Sperm travel from the testes to the body exterior through a system of ducts Page no. 1058

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Self-Check: Section 27.3 Q. 3 Page no. 1059 27.6 The male sexual response includes erection and ejaculation Page no. 1063 27.7 Spermatogenesis is the sequence of events that leads to formation of sperm Page no. 1063
			HAP.8.3 Describe the female reproductive anatomy and relate structure to egg production and release.	27: The Reproductive System Part 3 Anatomy of the Female Reproductive System Page no. 1071 27.9 Immature eggs develop in follicles in the ovaries Page no. 1071 27.10 The female duct system includes the uterine tubes, uterus, and vagina Page no. 1072 27.13 Oogenesis is the sequence of events that leads to the formation of ova Page no. 1078 27.14 The ovarian cycle consists of the follicular phase and the luteal phase Page no. 1083
			HAP.8.4 Construct explanations detailing the role of hormones in the regulation of sperm and egg	27: The Reproductive System 27.8 Male reproductive function is regulated by hypothalamic, anterior

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			development. Analyze the role of negative feedback in regulation of the female menstrual cycle and pregnancy.	pituitary, and testicular hormones Page no. 1069 27.14 The ovarian cycle consists of the follicular phase and the luteal phase Page no. 1083 27.15 Female reproductive function is regulated by hypothalamic, anterior pituitary, and ovarian hormones Page no. 1083 28: Pregnancy and Human Development 28.2 Embryonic development begins as the zygote undergoes cleavage and forms a blastocyst en route to the uterus Page no. 1107 28.3 Implantation occurs when the embryo burrows into the uterine wall, triggering placenta formation Page no. 1109 Figure 28.6 Hormonal changes during pregnancy. Page no. 1109
			HAP.8.5 Evaluate and communicate information about various contraceptive methods to prevent	Chapter 27: Review Questions Q. 24 Page no. 1100

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards Total Standards: 14				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			fertilization and/or implantation.	
			HAP.8.6 Describe the changes that occur during embryonic/fetal development, birth, and the growth and development from infancy, childhood, and adolescence to adult.	28: Pregnancy and Human Development 28.2 Embryonic development begins as the zygote undergoes cleavage and forms a blastocyst en route to the uterus Page no. 1107 to 28.7 An infant's extrauterine adjustments include taking the first breath and closure of vascular shunts Page no. 1126 28.8 Lactation is milk secretion by the mammary glands in response to prolactin Page no. 1127
			HAP.8.7 Research and analyze the causes and effects of various pathological conditions (e.g., infertility, ovarian cysts, endometriosis, sexually transmitted diseases, and ectopic pregnancy). Research current treatments for infertility.	27: The Reproductive System 27.17 Sexually transmitted infections cause reproductive and other disorders Page no. 1090 Chapter 27: Related Clinical Terms Page no. 1096

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Case Study 23-Year-Old Female with Menstrual Irregularity Page no. 1100 28: Pregnancy and Human Development 28.9 Assisted reproductive technology may help an infertile couple have offspring Page no. 1129 Chapter 28: Related Clinical Terms Page no. 1130 Clinical Case Study 38-Year-Old Female with Preeclampsia Page no. 1133
HAP.9 Blood	Blood is the necessary fluid that transports oxygen and other elements throughout the body and removes waste products. Blood's unique composition allows for grouping into four major blood type groups (A, B, AB, and O).	HAP.9 Students will analyze the structure and functions of blood and its role in maintaining homeostasis.	HAP.9.1 Describe the structure, function, and origin of the cellular components and plasma components of blood.	17: Blood 17.2 Blood consists of plasma and formed elements Page no. 643 Blood Plasma Page no. 644 Table 17.1 Composition of Plasma Page no. 644 Formed Elements Page no. 645 17.3 Erythrocytes play a crucial role in oxygen and carbon dioxide transport Page no. 645

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	Blood types are based on the presence or absence of inherited antigens on the surface of the red blood cells.			Functions of Erythrocytes Page no. 646 Production of Erythrocytes Page no. 647 Figure 17.5 Erythropoiesis: formation of red blood cells. Page no. 648 17.4 Leukocytes defend the body Page no. 651 Figure 17.11 Leukocyte formation. Page no. 655 17.5 Platelets are cell fragments that help stop bleeding Page no. 657
			HAP.9.2 Distinguish the cellular difference between the ABO blood groups and investigate blood type differences utilizing antibodies to determine compatible donors and recipients.	17: Blood 17.7 Transfusion can replace lost blood (Clinical) Page no. 663 Human Blood Groups Page no. 664 ABO Blood Groups Page no. 664 Table 17.4 ABO Blood Groups Page no. 664
			HAP.9.3 Research and analyze the causes and effects of various pathological conditions (e.g., anemia, malaria, leukemia, hemophilia, and blood doping).	17: Blood Clinical: Erythrocyte Disorders Page no. 650 Figure 17.8 Sickle-cell anemia. Page no. 650 Polycythemia Page no. 651

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Homeostatic Imbalance 17.1 (Clinical) Page no. 651 Clinical: Leukocyte Disorders Page no. 655 Chapter 17: Related Clinical Terms
			HAP.9.4 Enrichment: Use an engineering design process to develop effective treatments for blood disorders (e.g., methods to regulate blood cell counts or blood doping tests).*	17: Blood Chapter 17: Review Questions Level 3 Evaluate/Synthesize Q. 22 to Q. 27 Page no. 669
HAP.10 Cardiovascular System	The cardiovascular system is composed of the heart and blood vessels. The heart is the mechanism that cycles the blood throughout the body via the blood vessels. Using blood as a carrier, the system transports nutrients, gases, wastes, antibodies, electrolytes, and many other substances to and from	HAP.10 Students will investigate the structures and functions of the cardiovascular system, including the cause and effect of diseases and disorders.	HAP.10.1 Design and use models to investigate the functions of the organs of the cardiovascular system.	18: The Cardiovascular System: The Heart 18.1 The heart has four chambers and pumps blood through the pulmonary and systemic circuits Page no. 671 Figure 18.3 The layers of the pericardium and of the heart wall. Figure 18.4 **The circular and spiral arrangement of cardiac muscle bundles in the myocardium of the heart.** Page no. 674 Figure 18.5

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	the cells of the body. The location, size, and orientation of the heart, blood vessels, veins, arteries, and capillaries are essential in maintaining cardiovascular health. Maintenance of this system is vital.			**Gross anatomy of the heart.** Page no. 675 18.2 Heart valves make blood flow in one direction Page no. 679 18.3 Blood flows from atrium to ventricle, and then to either the lungs or the rest of the body Page no. 681
			HAP.10.2 Describe the flow of blood through the pulmonary system and systemic circulation.	18: The Cardiovascular System: The Heart The Pulmonary and Systemic Circuits Page no. 671 Figure 18.1 The systemic and pulmonary circuits. Page no. 671
			HAP.10.3 Investigate the structure and function of different types of blood vessels (e.g., arteries, capillaries, veins). Identify the role each plays in the transport and exchange of materials.	19: The Cardiovascular System: Blood Vessels Part 1 Blood Vessel Structure and Function Page no. 707 19.1 Most blood vessel walls have three layers Page no. 709 19.2 Arteries are pressure reservoirs, distributing vessels, or resistance vessels Page no. 710

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				19.3 Capillaries are exchange vessels Page no. 711 19.4 Veins are blood reservoirs that return blood toward the heart Page no. 714 19.5 Anastomoses are special interconnections between blood vessels Page no. 715
			HAP.10.4 Demonstrate the role of valves in regulating blood flow.	18: The Cardiovascular System: The Heart 18.2 Heart valves make blood flow in one direction Page no. 679 18.3 Blood flows from atrium to ventricle, and then to either the lungs or the rest of the body Page no. 681 Focus Figure 18.1 Blood Flow through the Heart
			HAP.10.5 Plan and conduct an investigation to test the effects of various stimuli on heart rate and/or blood pressure. Construct graphs to analyze data and communicate conclusions.	18: The Cardiovascular System: The Heart 18.6 The cardiac cycle describes the mechanical events associated with blood flow through the heart Page no. 693 Focus Figure 18.2 The Cardiac Cycle Page no. 694 Check Your Understanding: Section 18.6 Q. 18 Page no. 696

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				18.7 Stroke volume and heart rate are regulated to alter cardiac output Page no. 696 Afterload: Back Pressure Exerted by Arterial Blood Page no. 698 Regulation of Heart Rate Page no. 698 Autonomic Nervous System Page no. 698 Regulation of Heart Rate Chemical Regulation of Heart Rate Page no. 699 Other Factors That Regulate Heart Rate Page no. 699
			HAP.10.6 Research and analyze the effects of various pathological conditions (e.g., hypertension, myocardial infarction, mitral valve prolapse, varicose veins, and arrhythmia).	18: The Cardiovascular System: The Heart Homeostatic Imbalance 18.1 (Clinical) Page no. 673 Homeostatic Imbalance 18.2 (Clinical) Page no. 680 Homeostatic Imbalance 18.3 (Clinical) Page no. 683 Homeostatic Imbalance 18.4 (Clinical) Page no. 688

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Homeostatic Imbalance 18.5 (Clinical) Page no. 692 Homeostatic Imbalance 18.6 (Clinical) Page no. 696 Homeostatic Imbalance 18.7 (Clinical) Page no. 699 Homeostatic Imbalance 18.8 (Clinical) Page no. 699 Homeostatic Imbalance 18.9 (Clinical) Page no. 701 Figure 18.23 Three examples of congenital heart defects. Page no. 701 Heart Function throughout Life Page no. 702 Chapter 18: Related Clinical Terms Page no. 702
			HAP.10.7 Enrichment: Use an engineering design process to develop, model, and test effective treatments for cardiovascular diseases (e.g., methods to regulate heart rate, artificial replacement	18: The Cardiovascular System: The Heart Clinical Case Study 54-Year-Old Female with a Defective Heart Valve Page no. 705

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards Total Standards: 14				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			valves, open blood vessels, or strengthening leaky valves).*	
HAP.11 Lymphatic System	The lymphatic system is composed of lymphoid vessels and organs. These vessels assist the cardiovascular system by maintaining blood volume. The lymphoid organs defend the body from pathogens by providing sites for development and maturation of immune system cells. There are multiple disorders of the immune system affecting the human population.	HAP. 11 Students will investigate the structures and functions of the lymphatic system, including the cause and effect of diseases and disorders.	HAP.11.1 Analyze the functions of leukocytes, lymph, and lymphatic organs in the immune system.	17: Blood 17.4 Leukocytes defend the body Page no. 651 General Structural and Functional Characteristics Page no. 651 Lymphocytes Page no. 653 20: The Lymphatic System and Lymphoid Organs and Tissues 20.1 The lymphatic system includes lymphatic vessels, lymph, and lymph nodes Page no. 768 Distribution and Structure of Lymphatic Vessels Page no. 768 Figure 20.2 Major lymphatic trunks and ducts. Page no. 770 Figure 20.3 The lymphatic system Page no. 770 Lymphoid Cells Page no. 771 Lymphoid Tissue Page no. 772 Lymphoid Organs Page no. 772

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				20.6 T lymphocytes mature in the thymus Page no. 777 Table 20.1 Summary of Lymphoid Organs and Tissues Page no. 778
			HAP.11.2 Compare the primary functions of the lymphatic system and its relationship to the cardiovascular system.	20: The Lymphatic System and Lymphoid Organs and Tissues Figure 20.1 20.1 The lymphatic system includes lymphatic vessels, lymph, and lymph nodes Page no. 768 Distribution and Structure of Lymphatic Vessels Page no. 768 Distribution and special features of lymphatic capillaries. Page no. 768 Lymph Transport Page no. 770 System Connections Homeostatic Interrelationships between the Lymphatic System/Immunity and Other Body Systems Page no. 779
			HAP.11.3 Compare and contrast the body's non-specific and specific lines of defense, including an analysis of the roles of various	17: Blood 17.4 Leukocytes defend the body Page no. 651 General Structural and Functional Characteristics Page no. 651

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			leukocytes: basophils, eosinophils, neutrophils, monocytes, and lymphocytes.	Neutrophils Page no. 652 Eosinophils Page no. 652 Basophils Page no. 653 Lymphocytes Page no. 653 Monocytes Page no. 653 20: The Lymphatic System and Lymphoid Organs and Tissues 20.5 Malt guards the body's entryways against pathogens Page no. 776 21: The Immune System: Innate and Adaptive Body Defenses 21.1 Surface barriers act as the first line of defense to keep invaders out of the body Page no. 785 21.2 Innate internal defenses are cells and chemicals that act as the second line of defense Page no. 786 Part 2 Adaptive Defenses Page no. 793 21.3 Antigens are substances that trigger the body's adaptive defenses Page no. 794 21.4 B and T lymphocytes and antigen-presenting cells are cells of the adaptive immune response Page no. 795

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards Total Standards: 14				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.11.4 Correlate the functions of the spleen, thymus, lymph nodes, and lymphocytes to the development of immunity.	17: Blood 17.4 Leukocytes defend the body: Lymphocytes Page no. 653 20: The Lymphatic System and Lymphoid Organs and Tissues 20.1 The lymphatic system includes lymphatic vessels, lymph, and lymph nodes Page no. 768 20.4 The spleen removes bloodborne pathogens and aged red blood cells Page no. 775 20.6 T lymphocytes mature in the thymus Page no. 776
			HAP.11.5 Differentiate the role of B-lymphocytes and T-lymphocytes in the development of humoral and cell-mediated immunity and primary and secondary immune responses.	17: Blood 17.4 Leukocytes defend the body: Lymphocytes Page no. 653 Figure 17.11 Leukocyte formation. Page no. 655 20: The Lymphatic System and Lymphoid Organs and Tissues 20.6 T lymphocytes mature in the thymus Page no. 776

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards Total Standards: 14				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				21: The Immune System: Innate and Adaptive Body Defenses 21.4 B and T lymphocytes and antigen-presenting cells are cells of the adaptive immune response Page no. 795 21.5 In humoral immunity, antibodies are produced that target extracellular antigens Page no. 799 21.6 Cellular immunity consists of T lymphocytes that direct adaptive immunity or attack cellular targets Page no. 805 Table 21.9 Cells and Molecules of the Adaptive Immune Response Page no. 814
			HAP.11.6 Investigate various forms of acquired and passive immunity (e.g., fetal immunity, breastfed babies, vaccinations, and plasma donations).	21: The Immune System: Innate and Adaptive Body Defenses 21.5 In humoral immunity, antibodies are produced that target extracellular antigens Page no. 799 Active and Passive Humoral Immunity Page no. 801 Chapter 21: Related Clinical Terms Page no. 818

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.11.7 Research and analyze the causes and effects of various pathological conditions (e.g., viral infections, auto-immune disorders, immunodeficiency disorders, and lymphomas).	17: Blood Clinical: Leukocyte Disorders Leukemias Page no. 655 Infectious Mononucleosis Page no. 656 Chapter 17: Related Clinical Terms Page no. 666 20: The Lymphatic System and Lymphoid Organs and Tissues Homeostatic Imbalance 20.1 (Clinical) Page no. 770 Chapter 20: Related Clinical Terms Page no. 780 21: The Immune System: Innate and Adaptive Body Defenses Antimicrobial Proteins Page no. 791 Interferons Page no. 791 Figure 21.4 The interferon mechanism against viruses. Page no. 791 21.7 Insufficient or overactive immune responses create problems (Clinical) Page no. 815 Immunodeficiencies Page no. 815 Autoimmune Diseases Page no. 816

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 21: Related Clinical Terms Page no. 818
HAP.12 Respiratory System	The respiratory system provides the body with an abundant and continuous supply of oxygen and removes carbon dioxide from the body. The organs of this system include the nose, pharynx, larynx, trachea, bronchi and their smaller branches, and the lungs. The interaction of these organs with the cardiovascular system transports respiratory gases to the tissue cells throughout the body. Interruptions in the mechanics of this system will lead to respiratory distress.	HAP. 12 Students will investigate the structures and functions of the respiratory system, including the cause and effect of diseases and disorders.	HAP.12.1 Design and use models to illustrate the functions of the organs of the respiratory system.	22: The Respiratory System Part 1 Functional Anatomy Page no. 824 Figure 22.2 The major respiratory organs in relation to surrounding structures. Page no. 824 Table 22.1 The Upper Respiratory System Page no. 824 Table 22. 2 The Lower Respiratory System Page no. 824 22.1 The upper respiratory system warms, humidifies, and filters air Page no. 824 22.2 The lower respiratory system consists of conducting and respiratory zone structures Page no. 828

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.12.2 Describe structural adaptations of the respiratory tract and relate these structural features to the function of preparing incoming air for gas exchange at the alveolus.	22: The Respiratory System Part 1 Functional Anatomy Page no. 824 22.1 The upper respiratory system warms, humidifies, and filters air Page no. 824 The Nose and Paranasal Sinuses Page no. 824 Nasal Cavity Page no. 825 Figure 22.4 The nasal cavity. Page no. 825 Nasal Conchae Page no. 826 Paranasal Sinuses Page no. 826 The Pharynx Page no. 826 Figure 22.5 The pharynx, larynx, and upper trachea. Page no. 826 The Nasopharynx Page no. 827 22.2 The lower respiratory system consists of conducting and respiratory zone structures The Larynx Page no. 828 The Trachea Page no. 831 The Bronchi and Subdivisions Page no. 832 Figure 22.9 Conducting zone passages

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Conducting Zone Structures Page no. 832
			HAP.12.3 Identify the five mechanics of gas exchange: pulmonary ventilation, external respiration, transport gases, internal respiration, and cellular respiration.	22: The Respiratory System 22.4 Volume changes cause pressure changes, which cause air to move Page no. 839 Pulmonary Ventilation Page no. 840 Focus Figure 22.1 The Mechanics of Breathing at Rest Page no. 840 Breathing Cycles and Muscles IP2 Video Page no. 840 22.6 Gases exchange by diffusion between the blood, lungs, and tissues Page no. 848 22.7 Oxygen is transported by hemoglobin, and carbon dioxide is transported in three different ways Page no. 852 Oxygen Transport Page no. 852 Focus Figure 22.2 The Oxygen-Hemoglobin Dissociation Curve Page no. 852 Tissue Oxygen Exchange IP2 Video Page no. 852 Oxygen Transport and Exchange: Summary

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				IP2 Video Page no. 853 Figure 22.24 Transport and exchange of CO2 and O2. Page no. 856
			HAP.12.4 Enrichment: Use an engineering design process to develop a model of the mechanisms that support breathing, and illustrate the inverse relationship between volume and pressure in the thoracic cavity.*	22: The Respiratory System 22.4 Volume changes cause pressure changes, which cause air to move Pulmonary Ventilation Page no. 839 Figure 22.14 **Intrapulmonary and intrapleural pressure relationships.** Page no. 839 Focus Figure 22.1 The Mechanics of Breathing at Rest Page no. 840 Transpulmonary Pressure Page no. 840 Boyle's Law and Respiratory Pressures IP2 Video Page no. 840
			HAP.12.5 Research and analyze the causes and effects of various pathological conditions (e.g., asthma, bronchitis, pneumonia, and COPD).	22: The Respiratory System 22.10 Respiratory diseases are major causes of disability and death (Clinical) Page no. 864 Chronic Obstructive Pulmonary Disease (COPD) Page no. 864 Chronic Bronchitis Page no. 865 Asthma Page no. 865

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Tuberculosis (TB) Page no. 865 Lung Cancer Page no. 865
			HAP.12.6 Research and discuss new environmental causes of respiratory distress (e.g., e-cigarettes, environmental pollutants, and changes in inhaled gas composition).	22: The Respiratory System Chapter 22: Review Questions Level 3 Evaluate/Synthesize Q. 25 Page no. 872
HAP.13 Digestive System	The digestive system processes food so that it can be absorbed and used by the body's cells. The organs of the system are responsible for food ingestion, digestion, absorption, and elimination of the undigested remains from the body.	HAP.13 Students will investigate the structures and functions of the digestive system, including the cause and effect of diseases and disorders.	HAP.13.1 Analyze the structure-function relationship in organs of the digestive system.	23: The Digestive System Part 2 Functional Anatomy of the Digestive System Page no. 881 Digestive IP Anatomy Review Animation Page no. 881 23.4 Ingestion occurs only at the mouth Page no. 883 23.5 The pharynx and esophagus move food from the mouth to the stomach Page no. 888 23.6 The stomach temporarily stores food and begins protein digestion Page no. 891 23.7 The liver secretes bile; the pancreas secretes digestive enzymes Page no. 901

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				23.8 The small intestine is the major site for digestion and absorption Page no. 907 Figure 23.31 Structural modifications of the small intestine that increase its surface area for digestion and absorption. Page no. 908 Motility of the Small Intestine Page no. 911 23.9 The large intestine absorbs water and eliminates feces Page no. 912
			HAP.13.2 Use models to describe structural adaptations present in each organ of the tract and correlate the structures to specific processing of food at each stage (e.g., types of teeth; muscular, elastic wall and mucous lining of the stomach; villi and microvilli of the small intestine; and sphincters along the digestive tract).	23: The Digestive System 23.4 Ingestion occurs only at the mouth Page no. 882 Figure 23.8 **Anatomy of the oral cavity (mouth).** Page no. 882 Figure 23.9 Dorsal surface of the tongue, and the tonsils. Page no. 883 Figure 23.10 The salivary glands. Page no. 884 Figure 23.11 Human dentition. Page no. 885 Figure 23.15

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Gross Anatomy of the Stomach Page no. 891 Anatomy of the stomach Page no. 891 Figure 23.16 Microscopic anatomy of the stomach. Page no. 892 Figure 23.31 Structural modifications of the small intestine that increase its surface area for digestion and absorption. Page no. 908 Figure 23.32 Microvilli of the small intestine. Page no. 909 Chapter 23: Review Questions Level 1 Remember/Understand Q. 2, 3, 10 Page no. 930
			HAP.13.3 Identify the accessory organs (i.e., salivary glands, liver, gallbladder, and pancreas) for digestion and describe their function.	23: The Digestive System 23.4 Ingestion occurs only at the mouth Page no. 882 The salivary glands. Page no. 884 Figure 23.11 23.7 The liver secretes bile; the pancreas secretes digestive enzymes Page no. 900 The Gallbladder Page no. 904

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards Total Standards: 14				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.13.4 Plan and conduct an experiment to illustrate the necessity of mechanical digestion for efficient chemical digestion.	23: The Digestive System 23.4 Ingestion occurs only at the mouth Page no. 882 Digestive Processes of the Mouth Page no. 887 Mastication (Chewing) Page no. 887
			HAP.13.5 Research and analyze the activity of digestive enzymes within different organs of the digestive tract, connecting enzyme function to environmental factors such as pH.	23: The Digestive System 23.6 The stomach temporarily stores food and begins protein digestion Page no. 891 Types of Gland Cells: Parietal Cells, Chief Cells Page no. 893 23.7 The liver secretes bile; the pancreas secretes digestive enzymes Page no. 900 Bile: Composition and Enterohepatic Circulation Page no. 903 The Pancreas Page no. 904 23.8 The small intestine is the major site for digestion and absorption Page no. 907 Intestinal Juice Page no. 910 Digestive Processes in the Small Intestine Page no. 911 Sources of Enzymes for Digestion Page no. 911

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			HAP.13.6 Evaluate the role of hormones (i.e., gastrin, leptin, and insulin) in the regulation of hunger and satiety/fullness.	23: The Digestive System 23.6 The stomach temporarily stores food and begins protein digestion Page no. 891 Enteroendocrine Cells Page no. 894 Table 23.1 Hormones and Paracrines That Act in Digestion Page no. 894 23.7 The liver secretes bile; the pancreas secretes digestive enzymes Page no. 900 The Pancreas Page no. 904 Figure 23.26 Structure of the enzyme-producing tissue of the pancreas. Page no. 904
			HAP.13.7 Research and analyze the causes and effects of various pathological conditions (e.g., GERD/acid reflux, stomach ulcers, lactose intolerance, irritable bowel syndrome, gallstones, appendicitis, and hormonal imbalances and obesity).	23: The Digestive System Homeostatic Imbalance 23.6 (Clinical) Page no. 889 Homeostatic Imbalance 23.7 (Clinical) Page no. 894 Figure 23.17 A gastric ulcer. Page no. 894 Homeostatic Imbalances of the Liver (Clinical) Page no. 904 Homeostatic Imbalance 23.9 (Clinical) Page no. 904

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Homeostatic Imbalance 23.10 (Clinical) Page no. 909 Homeostatic Imbalance 23.11 (Clinical) Page no. 912 Homeostatic Imbalance 23.14 (Clinical) Page no. 916 Homeostatic Imbalance 23.15 (Clinical) Page no. 917 Chapter 23: Related Clinical Terms Page no. 926
			AP.13.8 Enrichment: Use an engineering design process to develop effective treatments for gastrointestinal diseases (e.g., methods to regulate stomach acids or soothe ulcers, treat food intolerance, and dietary requirements/modifications).*	23: The Digestive System Chapter 23: Related Clinical Terms Page no. 926 Chapter 23: Review Questions Page no. 929 Level 3 Evaluate/Synthesize Q. 28 to 32 Page no. 930 Clinical Case Study 48-Year-Old Female with Gallstones Page no. 931
HAP.14 Urinary System	The urinary system regulates the body's homeostasis by removing nitrogenous wastes while	HAP.14 Students will investigate the structures and functions of the urinary system, including the cause and	HAP.14.1 Understand the structure and function of the urinary system in relation to maintenance of homeostasis.	25: The Urinary System 25.1 The kidneys have three distinct regions and a rich blood supply Page no. 981

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	maintaining water balance, electrolytes, and the blood's acid/base balance within the body. The kidney is the primary filtration and reabsorption organ of the urinary system, controlling the composition of urine and, in turn, regulating blood composition. Improper function of the kidneys could lead to death if not corrected.	effect of diseases and disorders.		25.2 Nephrons are the functional units of the kidney Page no. 984 Figure 25.6 Location and structure of nephrons. Page no. 984 25.3 Overview: Filtration, reabsorption, and secretion are the key processes of urine formation Page no. 990 Focus Figure 25.1 Three Major Renal Processes Page no. 990 26: Fluid, Electrolyte, and Acid-Base Balance 26.3 Sodium, potassium, calcium, and phosphate levels are tightly regulated Page no. 1027 26.5 Renal regulation is a long-term mechanism for controlling acid-base balance Page no. 1037 System Connections Homeostatic Interrelationships between the Urinary System and Other Body Systems Page no. 1044
			HAP.14.2 Describe the processes of filtration and	25: The Urinary System

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			selective reabsorption within the nephrons as it relates to the formation of urine and excretion of excess materials in the blood.	25.3 Overview: Filtration, reabsorption, and secretion are the key processes of urine formation Page no. 990 Focus Figure 25.1 Three Major Renal Processes Page no. 990 25.4 Urine formation, step 1: The glomeruli make filtrate Page no. 993 25.5 Urine formation, step 2: Most of the filtrate is reabsorbed into the blood Page no. 998 25.6 Urine formation, step 3: Certain substances are secreted into the filtrate Page no. 1002 Self-Check: Section 25.6 Page no. 1002
			HAP.14.3 Investigate relationship between urine composition and the maintenance of blood sugar, blood pressure, and blood volume.	25: The Urinary System 25.4 to 25.6 25.8 Page no. 993 to 1002 Renal function is evaluated by analyzing blood and urine Page no. 1008 Urine Chemical Composition Page no. 1009 Table 25.3 Abnormal Urinary Constituents Page no. 1009 Physical Characteristics Page no. 1009

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Check Your Understanding: Section 25.8 Page no. 1010 Self-Check: Section 25.8 Page no. 1010
			HAP.14.4 Enrichment: Conduct a urinalysis to compare the composition of urine from various “patients.”	25: The Urinary System 25.8 Renal function is evaluated by analyzing blood and urine Page no. 1008 Clinical Case Study 32-Year-Old Male with Diabetes on a Diuretic Page no. 1019 26: Fluid, Electrolyte, and Acid-Base Balance Level 3 Evaluate/Synthesize Q. 20 to 24 Page no. 1047
			HAP.14.5 Develop and use models to illustrate the path of urine through the urinary tract.	25: The Urinary System 25.3 Overview: Filtration, reabsorption, and secretion are the key processes of urine formation Page no. 990 Focus Figure 25.1 Three Major Renal Processes Page no. 990 How the Kidneys Make Urine IP2 Video Page no. 990 25.4 Urine formation, step 1: The glomeruli make filtrate Page no. 993 Glomerular Filtration: Summary

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				IP2 Video Page no. 997 25.6 Urine formation, step 3: Certain substances are secreted into the filtrate Page no. 1002 Tubular Reabsorption & Secretion: Summary IP2 Video Page no. 1002 25.7 The kidneys create and use an osmotic gradient to regulate urine concentration and volume Page no. 1003 Focus Figure 25.2 **Medullary Osmotic Gradient** Page no. 1004-1005
			HAP.14.6 Research and analyze the causes and effects of various pathological conditions and other kidney abnormalities (e.g., kidney stones, urinary tract infections, gout, dialysis, and incontinence).	**25: The Urinary System** Homeostatic Imbalance 25.1 (Clinical) Page no. 982 Homeostatic Imbalance 25.2 (Clinical) Page no. 982 Homeostatic Imbalance 25.3 (Clinical) Page no. 993 Homeostatic Imbalance 25.4 (Clinical) Page no. 997 Homeostatic Imbalance 25.5 (Clinical) Page no. 1009

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Human Anatomy & Physiology, ©2025				
Human Anatomy and Physiology Standards **Total Standards: 14**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Homeostatic Imbalance 25.6 (Clinical) Page no. 1010 Homeostatic Imbalance 25.7 (Clinical) Page no. 1012 Homeostatic Imbalance 25.8 (Clinical) Page no. 1013 Homeostatic Imbalance 25.9 (Clinical) Page no. 1015 Chapter 25: Related Clinical Terms Page no. 1015

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards Total Standards: 7				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
MAQ.1 Water Properties and Quality	Water is essential to all life on earth. The chemical and physical properties of water allow for all essential processes with biota. Analysis of water quality indicates ecosystem health and balance. Recycling of water throughout the biosphere allows for replenishment of fresh water, but contaminations by human activities are hindering the total amount of potable fresh water.	MAQ.1 Students will develop an understanding of the unique physical and chemical properties of water and how those properties shape life on earth.	MAQ.1.1 Characterize the physical and chemical properties of water, including specific heat, surface temperature, universal solvent, and hydrogen bonding between water molecules (i.e., cohesion/adhesion/capillary action).	**Partial coverage:** The text does not cover adhesion and capillary action. Chapter 5: Water and Seawater 5.1: Why Does Water Have Such Unusual Chemical Properties? Pages 140-141 Concept Check 5.1: Q 4 Page 141 5.2: What Important Physical Properties Does Water Possess? Pages 142-149 Concept Check 5.2: Q 2, Q 4 Page 149
			MAQ.1.2 Describe the role of water within biological systems (e.g., provides the medium necessary to allow for life processes such as protein synthesis, enzymatic reactions, and passive transport).	**Partial coverage:** The text does not cover the role of water in protein synthesis and enzymatic reactions in biological systems in general. The citation below is for the processes of Diffusion and Osmosis specifically in marine animals.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 12: Marine Life and the Marine Environment 12.4: How Are Marine Organisms Adapted to the Physical Conditions of the Ocean Diffusion Osmosis Page 398-399
			MAQ.1.3 Diagram, utilizing digital or physical models, the water cycle and how it relates to the total amount of fresh water available to living things at any given time.	**Partial coverage:** The text does not explain the link between the water cycle and the total amount of fresh water available to living things. Chapter 5: Water and Seawater 5.4: Why Does Seawater Salinity Vary Processes Affecting Seawater Salinity The Hydrologic Cycle Pages 155-156
			MAQ.1.4 Collect, analyze, and communicate quantitative data that includes dissolved oxygen, pH,	**Partial coverage:** The text does not cover measurement of all the

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			temperature, salinity, mineral content, nitrogen compounds, and turbidity from an aquatic environment (i.e., hydrometer, refractometer, Secchi disk, and chemical test kits).	characteristics or the tools listed in the objective. Chapter 5: Water and Seawater 5.3 Why is Seawater Salty? Determining Salinity Page 151 Chapter 13: Biological Productivity and Energy Transfer 13.1 What is Primary Productivity? The Color of Objects Page 416
			MAQ.1.5 Research, analyze, and communicate current technology and career opportunities available to collect this data on a global scale using CTD, buoy data, or satellites.	The text does not include content to cover this objective.
			MAQ.1.6 Enrichment: Use an engineering design process to reduce the effects of pollution in aquatic ecosystems (e.g., microplastics, garbage patches, oil spills, and eutrophication). Students will	**Partial coverage:** The text does not require students to use engineering design processes to design, develop and test their solutions. The citation below is for an ideation and feasibility exercise related to

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards Total Standards: 7				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			design a proposed solution based on current research and/or observations, and develop a model in order to test their design. Data from experimentation will be analyzed, organized graphically, and communicated to classmates to determine the effectiveness of the proposed solution.*	reducing marine pollution due to sewage. Chapter 11: Marine Pollution Essential Concepts Review: Marine Pollution Active Learning Exercise: Working with another student in class, discuss what we should do with sewage sludge if we can't dump it into the ocean. What are the most feasible options? Page 380
MAQ.2 Fluid Dynamics	Fluid dynamics include properties and features of waves, currents, and tides. Each of these is vital for uniformity of temperature and chemical balance within ecosystems. Physical changes can be attributed to the movement of water, including shoreline	MAQ.2 Students will develop an understanding of the principles of fluid dynamics as it relates to both salt and freshwater systems.	MAQ.2.1 Characterize wave features and wave properties, including wavelength, period, wave speed, breakers, and constructive waves and their effects on shoreline communities (e.g., headlands, embayments, shoreline erosion, and deposition).	Chapter 8: Waves and Water Dynamics 8.2: What Characteristics Do Waves Possess? Pages 252-255 8.3: How Do Wind-Generated Waves Develop? Pages 257-263

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	development, erosion, and island formation. Climate change is influencing changes in our present fluid dynamic models.			8.4: How Do Waves Change in the Surf Zone? Pages 264-266 8.5: How Are Tsunami Created? Page 271-275 Chapter 10: Beaches, Shoreline Processes, and the Coastal Ocean 10.3: What Features are Typical of Erosional and Depositional Shores? Pages 319-324
			MAQ.2.2 Survey predictable patterns of tides (i.e., tidal period and range, diurnal, semidiurnal, mixed, spring, and neap tides) to correlate with moon phases in graphical form.	Chapter 9: Tides 9.2: How Do Tides Vary during a Monthly Tidal Cycle? Pages 293-298 Concept Check 9.2: Q 1, 2, 4 Page 298
			MAQ.2.3 Summarize principles related to currents (e.g., global wind patterns, Coriolis effect, Ekman spiral, surface, thermohaline, upwelling, downwelling, El Niño, La	Chapter 6: Air-Sea Interaction 6.3: How Does the Coriolis Effect Influence Moving Objects? Pages 181-183

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			Niña, hurricanes, Barrier Island movement).	Concept Check 6.3 Page 183 6.4: What Global Atmospheric Circulation Patterns Exist? Pages 184-187 Chapter 7: Ocean Circulation 7.2: What Creates Ocean Surface Currents and How Are They Organized? Pages 215-217 7.3: What Causes Upwelling and Downwelling? Pages 220-221 7.4: What Are the Main Surface Circulation Patterns in Each Ocean Basin? El Nino-Southern Oscillation (ENSO) Conditions ENSO Cool Phase (La Nina) Pages 231-236

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Concept Check 7.4: Q 3 Page 236 Chapter 10: Beaches, Shoreline Processes, and the Coastal Ocean 10.3: What Features are Typical of Erosional and Depositional Shores? Barrier Islands Pages 320-323
			MAQ.2.4 Research, analyze, and communicate scientific arguments to support climate models that predict how global and regional climate change can affect Earth's systems (e.g., precipitation and temperature and their associated impacts on sea level, global ice volumes, and atmosphere and ocean composition).	Chapter 16: The Oceans and Climate Change Essential Concepts Review 16.1 Active Learning Exercise Page 566 16.4 Active Learning Exercise Page 567
			MAQ.2.5 Distinguish among lentic and lotic water systems, including water flow, seasonal overturn, and watershed mapping.	The text does not include content to cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
MAQ.3 Geological Features	Plate tectonics explain present geological features that can be described in different aquatic ecosystems. Natural phenomena, such as sea floor spreading, are caused by plate tectonic action. The distance from shoreline and availability of light classifies different areas of the ocean.	MAQ.3 Students will understand the principles of plate tectonics, sea floor spreading, and physical features of oceanic zones.	MAQ.3.1 Use geospatial data to analyze, explain, and communicate differences among the major geological features of specific aquatic ecosystems (e.g., plate tectonics, continental rise, continental slope, abyssal plain, trenches, sea mounts, island formation, and watersheds).	Chapter 2: Plate Tectonics and the Ocean Floor 2.2: What Additional Observations Led to the Theory of Plate Tectonics? Sea Floor Spreading and Features of Ocean Basins Worldwide Earthquakes Detecting Plate Motion with Satellites Pages 49-53 2.3: What Features Occur at Plate Boundaries? Pages 57-68 2.4: Testing the Model: Can Plate Tectonics Explain Other Features in the Ocean and on Land? Seamounts and Tablemounts Page 73
			MAQ.3.2 Develop an understanding of plate tectonics to predict certain geological features (e.g., sea	**Partial coverage:** The text does not discuss orogenesis.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			floor spreading, paleomagnetic measurements, and orogenesis).	Chapter 2: Plate Tectonics and the Ocean Floor 2.2: What Additional Observations Led to the Theory of Plate Tectonics? Paleomagnetism Magnetic Polarity Reversals Sea Floor Spreading and Features of Ocean Basins Pages 46-51
			MAQ.3.3 Classify zones of the ocean based on distance from shorelines (i.e., intertidal, neritic, oceanic, and benthic zones), temperature, and light availability (i.e., epipelagic, mesopelagic, bathypelagic, abyssopelagic, and hadopelagic).	Chapter 12: Marine Life and the Marine Environment 12.5: What Are the Main Divisions of the Marine Environment? Pages 404-407
			MAQ.3.4 Classify zones of freshwater sources based on the velocity of current, depth, and temperature.	The text does not include content to cover this objective.
MAQ.4 Flora and Fauna	Unique flora and fauna can be found in different aquatic ecosystems. Their	MAQ.4 Students will examine characteristics of specific aquatic ecosystems and the	MAQ.4.1 Compare and contrast the unique biotic and abiotic characteristics of the following selected aquatic ecosystems:	**Partial coverage:** The text does not cover the biotic and abiotic characteristics of all the aquatic ecosystems listed in the objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards Total Standards: 7				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	features and unique biochemistry may serve to further the human quality of life. However, human impacts and natural events have altered many of these ecosystems in different ways.	effects of human and natural phenomena on those ecosystems.	intertidal zone, wetlands/estuaries, coral reef, barrier islands, continental slope/shelf, abyss, rivers/streams/watersheds, and lakes/ponds.	Chapter 15: Animals of the Benthic Environment 15.1: What Communities Exist Along Rocky Shores? Intertidal Zonation Pages 490-494 15.3 What Communities Exist on the Shallow Offshore Ocean Floor? Coral Reefs: Organisms and Their Adaptations Pages 504-506
			MAQ.4.2 Recognize representative examples of plants and animals that would be specifically adapted to the aquatic ecosystems, and identify adaptations necessary to survive.	Chapter 14: Animals of the Pelagic Environment 14.1 How Are Marine Organisms Able to Stay Above the Ocean Floor? Pages 456-461 14.2 What Adaptations Do Pelagic Organisms Possess for Seeking Prey? Pages 462-467

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				14.3 What Adaptations Do Pelagic Organisms Possess to Avoid Becoming Prey? Pages 468-469 14.4 What Characteristics Do Marine Mammals Possess? Pages 470-485 Chapter 15: Animals of the Benthic Environment 15.3 What Communities Exist on the Shallow Offshore Ocean Floor? Coral Reefs: Organisms and Their Adaptations Pages 504-506
			MAQ.4.3 Determine the niches within trophic levels in the aquatic ecosystems by creating food webs and researching the symbiotic relationships that exist.	Chapter 13: Biological Productivity and Energy Transfer 13.4 How Are Energy and Nutrients Passed Along in Marine Ecosystems? Trophic Levels Food Chains

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Food Webs Biomass Pyramid Pages 435-437 Essential Concepts Review 13.4 Critical Thinking Question Page 453
			MAQ.4.4 Research, analyze, and communicate the effects of urbanization and continued expansion by humans on the aquatic ecosystems' biodiversity (e.g., land use changes, erosion and sedimentation, over-fishing, invasive/exotic species, and pollution).	Chapter 11: Marine Pollution 11.2 What Marine Environmental Problems Are Associated with Petroleum Pollution? How Damaging in Oil Pollutant in the Ocean? Other Concerns About Oil in the Ocean Pages 362-364 11.3 What Marine Environmental Problems Are Associated with Non-Petroleum Chemical Pollution? Sewage Sludge Page 365 DDTs and PCBs

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				DDT and Eggshells Page 366 Bioaccumulation and Biomagnification Page 367 Other Types of Chemical Pollutants Page 369 11.4: What Marine Environmental Problems Are Associated with Non-point Source Pollution, Including Trash? Plastics as Marine Debris Plastic Nurdles in the Marine Environment Microplastics Pages 371-373 11.6: What Marine Environmental Problems Are Associated with Biological Pollution? Page 379

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Essential Concepts Review: Marine Pollution 11.2 Active Learning Exercise 11.3 Critical Thinking Question 11.4 Critical Thinking Question 11.4 Active Learning Exercise 11.5 Critical Thinking Question 11.6 Critical Thinking Question 11.6 Active Learning Exercise Pages 380-381 Chapter 13: Biological Productivity and Energy Transfer 13.5 What Issues Affect Marine Fisheries? Overfishing Pages 439-440 Effect of Global Climate Change on Marine Fisheries Page 450

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			MAQ.4.5 Explore the importance of species diversity to the biological resources needed by human populations, including food (e.g., aquaculture and mariculture), medicine, and natural aesthetics.	**Partial coverage:** The text does not cover in much detail the importance of species diversity with reference to the needs of humans. The citations below refer to content related to food and medicine needs. Chapter 13: Biological Productivity and Energy Transfer 13.5 What Issues Affect Marine Fisheries? World Fish Production Page 440 Seafood Choices Page 450 Chapter 15: Animals of the Benthic Environment 15.2 What Communities Exist Along Sediment-Covered Shores?

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Students Sometimes Ask…What is the most venomous marine organism? Page 497
			MAQ.4.6 Research, analyze, and communicate the effects of natural phenomena (e.g., hurricanes, floods, drought, and sea-level rise) on the aquatic ecosystems.	The text does not cover content related to this objective. The citations below refer to critical thinking questions that are somewhat related to the objective. Chapter 12: Marine Life and the Marine Environment Essential Concepts Review 12.3 Critical Thinking Question Page 409 Chapter 16: The Oceans and Climate Change Essential Concepts Review 16.4 Critical Thinking Question Page 567
			MAQ.4.7 Research, analyze, and communicate which and in what capacity local, state, and federal	**Partial coverage:** The text makes passing references to the Clean Water Act and the Endangered Species Act and there are no

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards Total Standards: 7				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			regulatory agencies are involved in different aquatic ecosystems, including current environmental policies already in place (e.g., the Clean Water Act and the Endangered Species Act). Research should include, but is not limited to, how humans can preserve animal diversity through the use of habitat creation and conservation, research, legislation, medical and breeding programs, and management of genetic diversity at local and global levels.	research opportunities based on these. However, the citations below list examples of other interventions by local/state/federal regulatory agencies. Chapter 10: Beaches, Shoreline Processes, and the Coastal Ocean 10.7 What Issues Face Coastal Wetlands? Serious Loss of Valuable Wetlands Page 349 (reference to the Office of Wetlands Protection) Climate Connection Process of Science 10.1 Recycling Christmas Trees to Save Louisiana's Disappearing Coast Page 350 Essential Concepts Review 10.7 Active Learning Exercise Page 353

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 13: Biological Productivity and Energy Transfer 13.5 What Issues Affect Marine Fisheries Diving Deeper 13.2 Focus on the Environment Protecting Our Oceans: What Are Marine Protected Areas (MPAs)? Page 447 Essential Concepts Review 13.2 Active Learning Exercise 13.5 Critical Thinking Question 13.5 Active Learning Exercise Pages 452-453
			MAQ.4.8 Enrichment: Choose an environmental issue that currently exists in one of the aquatic ecosystems and use an engineering design process to propose and develop a possible solution using scientific knowledge and best management practices (BMPs). Create an environmental	Chapter 16: The Oceans and Climate Change Essential Concepts Review 16.5 Critical Thinking Question Page 567

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			action plan to include moral, legal, societal, political, and economic decisions that impact animal diversity in both the short and long term. Results from developed plans will be communicated with classmates.*	
MAQ.5 Primary Producers	Primary producers are the basis of every food web in aquatic ecosystems. While many producers are photosynthetic autotrophs, chemosynthesis is also a common form of energy conversion. Surveying shared and derived characteristics of producers demonstrates evolutionary development. Various methods are currently utilized to measure primary productivity in various ecosystems.	MAQ.5 Students will explore the biodiversity and interactions among aquatic life.	MAQ.5.1 Survey common primary producers and their roles in primary production in relation to geographical distribution within various aquatic ecosystems.	Chapter 13: Biological Productivity and Energy Transfer 13.2 What Kind of Photosynthetic Marine Organisms Exist? Pages 420-422 Photosynthetic Bacteria Page 426 13.3 How Does Regional Primary Productivity Vary? Pages 428-430 Comparing Regional Productivity Page 432 Essential Concepts Review 13.2 Critical Thinking Question 13.3 Critical Thinking Question

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Page 452
			MAQ.5.2 List and describe common autotrophs that may be found in particular aquatic ecosystems, including prokaryotes (e.g., Cyanobacteria and Archaebacteria), protists (e.g., diatoms, dinoflagellates, green algae, kelp, sargassum, and red algae), and plants (e.g., cord grasses, reeds, seagrasses, and mangroves).	Chapter 12: Marine Life and the Marine Environment 12.2: How Are Marine Organisms Classified? Pages 388-391 Chapter 13: Biological Productivity and Energy Transfer 13.2 What Kind of Photosynthetic Marine Organisms Exist? Pages 420-424
			MAQ.5.3 Recognize characteristics that are shared and derived using graphical representations of primary-producer evolution and develop cladograms/phylogenetic trees.	The text does not cover this objective.
			MAQ.5.4 Use dichotomous keys to identify sample producers within an aquatic ecosystem.	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			MAQ.5.5 Paraphrase energy conversion processes (e.g., photosynthesis and chemosynthesis).	Chapter 13: Biological Productivity and Energy Transfer 13.4 How Are Energy and Nutrients Passed Along in Marine Ecosystems? Page 433 Chapter 15: Animals of the Benthic Environment 15.4 What Communities Exist on the Deep-Ocean Floor? Chemosynthesis SmartFigure 15.28 Comparing chemosynthesis (top panel) and photosynthesis (bottom panel) Watch SmartFigure 15.28 Comparing chemosynthesis and photosynthesis Page 516 Essential Concepts Review 15.4 Critical Thinking Question Page 523

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			MAQ.5.6 Enrichment: Research, analyze, and communicate historical and current methodologies for measuring primary productivity. Use an engineering design process to design and develop improvements to measure primary productivity (e.g., the light and dark bottle method and satellite data).*	The text does not provide students the opportunity to conduct the enrichment activity described in the objective. **Content reference** Chapter 13: Biological Productivity and Energy Transfer 13.1 What is Primary Productivity? Measurement of Primary Productivity Page 412
MAQ.6 Invertebrate Consumers	Many consumers found within aquatic ecosystems range from single-celled protozoa to multicellular invertebrates. While many of these consumers share basic morphological characteristics, derived characters demonstrate evolutionary relationships. Varied adaptations are	MAQ.6 Students will investigate characteristics of aquatic invertebrates.	MAQ.6.1 Characterize aquatic representatives of the following taxa: Protozoa (e.g., foraminiferians, radiolarians, amoeba, and paramecium), Porifera, Cnidaria, Platyhelminthes, Nematoda, Annelida, Rotifera, Mollusca, Arthropoda, Bryozoa, Brachiopoda, and Echinodermata.	**Partial coverage:** The text does not cover amoeba, paramecium, Porifera, Platyhelminthes, Nematoda, Rotifera, Bryozoa. Chapter 14: Animals of the Pelagic Environment 14.1 How Are Marine Organisms Able to Stay Above the Ocean Floor? Pages 456-461

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	found among these organisms for successful niches within selected ecosystems.			Chapter 15: Animals of the Benthic Environment 15.2 What Communities Exist Along Sediment-Covered Shores? Sandy Beaches: Organisms and Their Adaptations Pages 498-500
			MAQ.6.2 Identify characteristics that are shared and derived using graphical representations of animal evolution (i.e., cladograms and phylogenetic trees) and develop cladograms and phylogenetic trees.	The text does not cover this objective.
			MAQ.6.3 Develop a dichotomous classification key to be used in the identification of sample aquatic invertebrates.	The text does not cover this objective.
			MAQ.6.4 Compare and contrast major body plans (e.g., asymmetry, radial, bilateral symmetry, acoelomate, pseudocoelomate, and eucoelomate).	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			MAQ.6.5 Explain various life cycles found among animals (e.g., polyp and medusa in cnidarians, multiple hosts and stages in the platyhelminthic life cycle, and arthropod metamorphosis).	The text does not cover this objective.
			MAQ.6.6 Dissect representative taxa (e.g., clam and squid), collect data, compare their internal and external anatomy, analyze, explain, and communicate results.	The text does not cover this objective.
			MAQ.6.7 Using key morphological and physiological adaptations found within animal taxa, assess how animals interact with their environment to determine their ecological roles.	Chapter 14: Animals of the Pelagic Environment 14.1 How Are Marine Organisms Able to Stay Above the Ocean Floor? Pages 456-461 14.2 What Adaptations Do Pelagic Organisms Possess for Seeking Prey? Pages 462-467

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				14.3 What Adaptations Do Pelagic Organisms Possess to Avoid Becoming Prey? Pages 468-469 14.4 What Characteristics Do Marine Mammals Possess? Pages 470-485 Chapter 15: Animals of the Benthic Environment 15.3 What Communities Exist on the Shallow Offshore Ocean Floor? Coral Reefs: Organisms and Their Adaptations Pages 504-506
			MAQ.6.8 Enrichment: Given a niche in a specific environment, use an engineering design process to design an animal, listing characteristics based on your knowledge of shared and derived characters, internal and external anatomy, and how the animal would	The text does not provide students the opportunity to conduct the enrichment activity described in the objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards Total Standards: 7				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			adapt morphologically and physiologically relative to its ecological role and specific environment.*	
MAQ.7 Vertebrate Consumers	Other consumers that inhabit aquatic ecosystems are found within Phylum Chordata. While many of these consumers share basic morphological characteristics, derived characteristics demonstrate evolutionary relationships. Various adaptations are found among these organisms for successful niches within selected ecosystems.	MAQ.7 Students will investigate characteristics of aquatic invertebrates.	MAQ.7.1 Characterize aquatic representatives of the following taxa: Hemichordata, Urochordata, Cephalochordata, and Vertebrata (including Agnatha, Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves, and Mammalia).	The text does not cover this objective.
			MAQ.7.2 Identify characteristics that are shared and derived using graphical representation of animal evolution, and develop cladograms/phylogenetic trees.	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			MAQ.7.3 Utilize a dichotomous key to identify select aquatic vertebrates.	The text does not cover this objective.
			MAQ.7.4 Differentiate various life cycles found among animals (e.g., egg, tadpole, and adult stages of the amphibian life cycle; leathery eggs on land in reptiles; hard-shelled eggs in Aves; placental, marsupial, or monotremes in mammals; viviparous, ovoviviparous, and oviparous animals).	The text does not cover this objective.
			MAQ.7.5 Dissect representative taxa (e.g., shark, fish); collect data; compare their internal and external anatomy; and analyze, explain, and communicate results.	The text does not cover this objective.
			MAQ.7.6 Using key morphological and physiological adaptations found within aquatic vertebrate taxa, assess how animals interact with their environment to determine their ecological roles.	The text does not cover this objective.
			MAQ.7.7 Enrichment: Given a niche in a specific environment, use an engineering design process to	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Essentials of Oceanography, 13e, ©2020				
Marine and Aquatic Science I & II Standards **Total Standards: 7**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			design an animal, listing characteristics based on your knowledge of shared and derived characteristics, internal and external anatomy, and how the animal would adapt morphologically and physiologically relative to its ecological role and specific environment.*	

Objectives identified by "Enrichment:" are considered enrichment material that may be expanded upon as time permits. Engineering standards are represented in some performance objectives with specific wording that will prompt students to approach learning and exploration using the engineering process. These performance objectives are marked with an * at the end of the statement.

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
PHS.1 Nature of Matter	To actively develop scientific investigation, reasoning, and logic skills, this standard develops basic ideas about the characteristics and structure of matter. Matter is anything that has mass and occupies space. All matter is made up of small particles called atoms. Matter can exist as a solid, liquid, gas, or plasma.	PHS.1 Students will demonstrate an understanding of the nature of matter.	PHS.1.1 Use contextual evidence to describe particle theory of matter. Examine the particle properties of solids, liquids, and gases.	Chapter 6: Heat 6.1 Kinetic Theory of Matter Page 118	
			PHS.1.2 Use scientific research to generate models to compare physical and chemical properties of elements, compounds, and mixtures.	This topic is not covered in the text.	
			PHS.1.3 Conduct an investigation to determine the identity of unknown substances	This topic is not covered in the text.	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
			by comparing properties to known substances.		
			PHS.1.4 Design and conduct investigations to explore techniques in measurements of mass, volume, length, and temperature.	Chapter 2: Describing Motion 2.3 Mass – A measure of Inertia Page 25	2.3 Mass – A measure of Inertia (Describe and distinguish between mass and weight +density)
			PHS.1.5 Design and conduct an investigation using graphical analysis (e.g., line graph) to determine the density of liquids and/or solids.	This topic is not covered in the text.	
			PHS.1.6 Use mathematical and computational analysis to solve density problems. Manipulate the density formula to determine density, volume, or mass or use dimensional analysis to solve problems.	This topic is not covered in the text.	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
PHS.2 Atomic Theory	Many scientists have contributed to our understanding of atomic structure. The atom is the basic building block of matter and consists of subatomic particles (proton, neutron, electron, and quark) that differ in their location, charge, and relative mass.	PHS.2 Students will demonstrate an understanding of both modern and historical theories of atomic structure.	PHS.2.1 Research and develop models (e.g., 3-D models, online simulations, or ball and stick) to investigate both modern and historical theories of atomic structure. Compare models and contributions of Dalton, Thomson, Rutherford, Bohr, and of modern atomic theory.	Chapter 9: Atoms and the Periodic Table 9.5 – The Quantum Hypothesis Pages 226-227	9.5 – The Quantum Hypothesis (how the quantum nature of energy led to Bohr's planetary model of the atom)
PHS.3 Periodic Table	The organization of the periodic table allows scientists to obtain information and develop an understanding of concepts of atomic interactions. Developing scientific investigations increases logical reasoning and	PHS.3 Students will analyze the organization of the periodic table of elements to predict atomic interactions.	PHS.3.1 Use contextual evidence to determine the organization of the periodic table, including metals, metalloids, and nonmetals; symbols; atomic number; atomic mass; chemical families/groups; and periods/series.	Chapter 9: Atoms and the Periodic Table 9.1 – The Elements Page 213 9.2 Protons and Neutrons Pages 214-216 9.3 The Periodic Table Pages 217-223	9.1 – The Elements (Recognize the elements of the periodic table + atomic symbol + elemental formula) 9.2 Protons and Neutrons

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
	deduction skills to present the nature of science in the context of key scientific concepts.				(structure of the atomic nucleus + atomic number + calculation of atomic mass of an element) 9.3 The Periodic Table (The way the table is organized)
			PHS.3.2 Using the periodic table and scientific methods, investigate the formation of compounds through ionic and covalent bonding.	Chapter 11: Investigating Matter 11.4 Physical and Chemical Changes Pages 272–274 Chapter 12: Chemical Bonds and Mixtures 12.2 The Ionic Bond Pages 291–297 12.3 The Covalent Bond	11.4 Physical and Chemical Changes (Relates chemical bond to chemical change)

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
				Pages 298–300 12.4 Polar Covalent Bonds Pages 301–302	12.4 Polar Covalent Bonds (Differentiate ionic, polar covalent, and nonpolar covalent chemical bonds)
			PHS.3.3 Using naming conventions for binary compounds, write the compound name from the formula, and write balanced formulas from the name (e.g., carbon dioxide - CO2, sodium chloride - NaCl, iron III oxide- Fe2O3, and calcium bromide - CaBr2).	Chapter 11: Investigating Matter 11.7 Naming Compounds Page 279 Think and Explain (Synthesis) 11.7 Naming Compounds Page 286 Readiness Assurance Test (RAT) Q 10 Page 288	11.2 The Submicroscopic View of Matter (molecule as a fundamental unit of matter) 11.6 Elements to Compounds (Contrast compounds with the elements from which they are created+

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
					chemical formula) 11.7 Naming Compounds (Guidelines used to name compounds)
			PHS.3.4 Use naming conventions to name common acids and common compounds used in classroom labs (e.g., sodium bicarbonate (baking soda), NaHCO3; hydrochloric acid, HCl; sulfuric acid, H2SO4 ; acetic acid (vinegar), HC2H3O2; and nitric acid, HNO3).	Chapter 11: Investigating Matter 11.7 Naming Compounds Page 279	
			PHS.3.5 Use mathematical and computational analysis to determine the atomic mass of binary compounds.	This topic is not covered in the text.	
PHS.4 The Law of Conservation	The law of conservation of matter and energy	PHS.4 Students will analyze changes in matter and the	PHS.4.1 Design and conduct experiments to investigate	Chapter 11: Investigating Matter	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
of Matter and Energy	states that matter and energy can be transformed in different ways, but the total amount of mass and energy will be conserved. These concepts should be investigated and further developed in the classroom.	relationship of these changes to the law of conservation of matter and energy.	physical and chemical changes of various household products (e.g., rusting, sour milk, crushing, grinding, tearing, boiling, and freezing) and reactions of common chemicals that produce color changes or gases.	11.4 Physical and Chemical Properties Pages 272-274 11.5 Determining Physical and Chemical Changes Pages 275-276	
			PHS.4.2 Design and conduct investigations to produce evidence that mass is conserved in chemical reactions (e.g., vinegar and baking soda in a Ziploc© bag).	This topic is not covered in the text.	
			PHS.4.3 Apply the concept of conservation of matter to balancing simple chemical equations.	Chapter 13: Chemical Reactions 13.1 Chemical Equations Pages 327-328	13.1 Chemical Equations (Identify if a chemical equation is balanced or not balanced)

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards Total Standards: 9					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
			PHS.4.4 Use mathematical and computational analysis to examine evidence that mass is conserved in chemical reactions using simple stoichiometry problems (1:1 mole ratio) or atomic masses to demonstrate the conservation of mass with a balanced equation.	Chapter 13: Chemical Reactions 13.1 Chemical Equations Pages 327-328	
			PHS.4.5 Research nuclear reactions and their uses in the modern world, exploring concepts such as fusion, fission, stars as reactors, nuclear energy, and chain reactions.	Chapter 10: The Atomic Nucleus and Radioactivity 10.1 Radioactivity Page 242 10.2 The Strong Nuclear Force Page 243 10.3 Half Life and Transmutation Pages 243-244	10.1 Radioactivity (Three forms of radioactivity) 10.2 The Strong Nuclear Force (Holding nucleons in the nucleus) 10.3 Half Life and Transmutation (how radioactive elements can be

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
				10.3 Half Life and Transmutation Pages 243-244 10.3 Half Life and Transmutation Pages 245-249 10.4 Nuclear Fission Pages 250–254 10.5 Mass-Energy Equivalence Pages 250–254	identified by the half-life) 10.5 Mass-Energy Equivalence (Nuclear fusion)
			PHS.4.6 Analyze and debate the advantages and disadvantages of nuclear reactions as energy sources.	Chapter 10: The Atomic Nucleus and Radioactivity Think and Explain (Synthesis) Q 84, 87 Page 263 Think and Discuss (Evaluation) Q 92, 95	*Think and Explain/ Think and Discuss (Evaluation)/ has some questions on radiation- Page 264

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
				Page 264	
PHS.5 Newton's Laws of Motion	Kinematics (contact forces) describe the motion of objects using words, diagrams, numbers, graphs, and equations. The goal of any study of kinematics is to develop scientific models to describe and explain the motion of real-world objects. Newton's laws of motion are an example of a tool that can aid in the explanation of motion.	PHS.5 Students will analyze the scientific principles of motion, force, and work.	PHS.5.1 Research the scientific contributions of Newton, and use models to communicate Newton's principles.	Chapter 3: Newton's Law of Motion 3.1 Newton's First Law of Motion Page 44 3.2 Newton's Second Law of Motion Pages 45-48 3.4 Newton's Third Law of Motion Pages 51-52 3.6 Summary of Newton's Three Laws Pages 55-56	
			PHS.5.2 Design and conduct an investigation to study the motion of an object using properties such as displacement, time of motion, velocity, and acceleration.	Chapter 2: Describing Motion Acceleration Page 31 Chapter 3: Newton's Law of Motion	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards Total Standards: 9					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
				3.3 Forces and Interactions Page 49 3.5 Vectors Page 54	
			PHS.5.3 Collect, organize, and interpret graphical data using correct metric units to determine the average speed of an object.	Chapter 2: Describing Motion 2.8 Speed and Velocity Page 30	
			PHS.5.4 Use mathematical and computational analyses to show the relationships among force, mass, and acceleration (i.e., Newton's second law).	Chapter 3: Newton's Law of Motion 3.2 Newton's Second Law of Motion Pages 45-48	
			PHS.5.5 Design and construct an investigation using probe systems and/or online simulations to observe relationships between force, mass, and acceleration (F=ma).	Partial alignment Chapter 3: Newton's Law of Motion Think and Do (Hands-On Application) Q 36 Page 61	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
			PHS.5.6 Use an engineering design process and mathematical analysis to design and construct models to demonstrate the law of conservation of momentum (e.g., roller coasters, bicycle helmets, bumper systems).	Chapter 4: Momentum and Energy 4.1 Momentum Page 69 4.4 Conservation of Momentum Page 73	
			PHS.5.7 Use mathematical and computational representations to create graphs and formulas that describe the relationships between force, work, and energy (i.e., W=Fd, KE=½ mv2 , PE=mgh, W=KE).	Chapter 4: Momentum and Energy 4.5 Energy Page 74- 75 4.6 Power Page 76 4.9 The Work-Energy Theorem Page 79	
			PHS.5.8 Research the efficiency of everyday machines, and debate ways to improve their economic	Chapter 4: Momentum and Energy 4.11 Machines Page 81	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
			impact on society (e.g., electrical appliances, transportation vehicles).		
PHS.6 Waves	Waves are everywhere in nature. Understanding of the physical world is not complete until we understand the nature, properties, and behaviors of waves. Students have experienced transverse and horizontal waves in their everyday lives. The exploration of waves in greater depth will allow students to conceptualize these waves. The goal is to develop various models of waves and apply those	PHS.6 Students will explore the characteristics of waves.	PHS.6.1 Use models to analyze and describe examples of mechanical waves' properties (e.g., wavelength, frequency, speed, amplitude, rarefaction, and compression).	Chapter 8: Waves- Sound and Light 8.1 Vibrations and Waves Page 178 8.4 The Nature of Sound Page 181	8.1 Vibrations and Waves (Distinguish among amplitude, wavelength, frequency, and period) 8.4 The Nature of Sound (Compressions and rarefactions in a sound wave)

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
	models to understanding wave interactions.				
			PHS.6.2 Analyze examples and evidence of transverse and longitudinal waves found in nature (e.g., earthquakes, ocean waves, and sound waves).	Chapter 8: Waves- Sound and Light 8.3 Transverse and Longitudinal and Waves Page 180	
			PHS.6.3 Generate wave models to explore energy transference.	Chapter 8: Waves- Sound and Light 8.2 Wave Motion Page 179	8.2 Wave Motion (how energy is carried in waves)
			PHS.6.4 Enrichment: Use an engineering design process to design and build a musical instrument to demonstrate the influence of resonance on music.*	Chapter 8: Waves- Sound and Light Think and Do (Hands-On Application) Q 42 Page 203	
			PHS.6.5 Design and conduct experiments to investigate technological applications of sound (e.g., medical uses, music, acoustics, Doppler	Chapter 8: Waves- Sound and Light 8.13 The Doppler Effect Pages 196-197 8.7 Reflection	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
			effects, and influences of mathematical theory on music).	Page 184	
			PHS.6.6 Research real-world applications to create models or visible representations of the electromagnetic spectrum, including visible light, infrared radiation, and ultraviolet radiation.	Chapter 8: Waves- Sound and Light 8.6 The Nature of Light Page 183 8.8 Transparent and Opaque Materials Pages 185-186	
			PHS.6.7 Enrichment: Use an engineering design process to design and construct an apparatus that forms images to project on a screen or magnify images using lenses and/or mirrors.*	This topic is not covered in the text.	
			PHS.6.8 Enrichment: Debate the particle/wave behavior of light.	Chapter 8: Waves- Sound and Light 8.14 The Wave-Particle Duality Page 198	
PHS.7 Energy	Concepts about different energy forms	PHS.7 Students will examine different forms	PHS.7.1 Using digital resources, explore forms of energy (e.g.,	Chapter 4: Momentum and Energy	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
	and energy transformations continue to be expanded and explored in greater depth, leading to the development of more mathematical applications. Focus should be on students actively developing scientific investigations, reasoning, and logic skills.	of energy and energy transformations.	potential and kinetic energy, mechanical, chemical, electrical, thermal, radiant, and nuclear energy).	4.10 Conservation of Energy Page 80 4.7 Potential Energy Page 77 4.8 Kinetic Energy Page 78	
			PHS.7.2 Use scientific investigations to explore the transformation of energy from one type to another (e.g., potential to kinetic energy, and mechanical, chemical, electrical, thermal, radiant, and nuclear energy interactions).	Chapter 4: Momentum and Energy Think and Do (Hands-On Application) Q 37 Page 86	
			PHS.7.3 Using mathematical and computational analysis,	Chapter 4: Momentum and Energy	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
			calculate potential and kinetic energy based on given data. Use equations such as PE=mgh and KE=½ mv2.	4.9 The Work-Energy Theorem Page 79	
			PHS.7.4 Conduct investigations to provide evidence of the conservation of energy as energy is converted from one form of energy to another (e.g., wind to electric, chemical to thermal, mechanical to thermal, and potential to kinetic).	Chapter 4: Momentum and Energy 4.10 Conservation of Energy Page 80 Think and Do (Hands-On Application) Q 37 Page 86	
PHS.8 Thermal Energy	Thermal energy is transferred in the form of heat. Heat is always transferred from an area of high heat to low heat. More complex concepts and terminology related to phase changes are developed, including	PHS.8 Students will demonstrate an understanding of temperature scales, heat, and thermal energy transfer.	PHS.8.1 Compare and contrast temperature scales by converting between Celsius, Fahrenheit, and Kelvin.	Chapter 6: Heat 6.2 Temperature Page 119 6.3 Absolute Zero Page 120	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
	the distinction between heat and temperature.				
			PHS.8.2 Apply particle theory to phase change and analyze freezing point, melting point, boiling point, vaporization, and condensation of different substances.	Chapter 11: Investigating Matter 11.3 Phase Change Page 271	
			PHS.8.3 Relate thermal energy transfer to real world applications of conduction (e.g., quenching metals), convection (e.g., movement of air masses/weather/plate tectonics), and radiation (e.g., electromagnetic).	Chapter 6: Heat 6.4 Heat Page 121 6.5 The Laws of Thermodynamics Pages 122-124 6.6 Specific Heat Capacity Pages 125-126 6.7 Thermal Expansion Page 128 6.8 Heat Transfer: Conduction Page 129	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
				6.9 Heat Transfer: Convection Page 130 6.10 Heat Transfer: Radiation Page 131	
			PHS.8.4 Enrichment: Use an engineering design process to construct a simulation of heat energy transfer between systems. Calculate the calories/joules of energy generated by burning food products. Communicate conclusions based on evidence from the simulation.*	This topic is not covered in the text.	
PHS.9 Electricity	Electrical energy (both battery and circuit energy) is transformed into other forms of energy. Charged particles and	PHS.9 Students will explore basic principles of magnetism and electricity (e.g., static electricity, current electricity, and circuits).	PHS.9.1 Use digital resources and online simulations to investigate the basic principles of electricity, including static electricity, current electricity, and circuits.	Chapter 7: Electricity and Magnetism 7.7 Electric Current Pages 151-152 7.8 Electrical Resistance	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
	magnetic fields are similar because they both store energy. Magnetic fields exert forces on moving charged particles. Students investigate practical uses of these concepts and develop a working understanding of the basic concepts of magnetism and electricity.		Use digital resources (e.g., online simulations) to build a model showing the relationship between magnetic fields and electric currents.	Page 153 7.9 Ohm's law Pages 154-155 7.10 Electric Circuits Page 156 7.15: Electromagnetic induction Page 164	
			PHS.9.2 Distinguish between magnets, motors, and generators, and evaluate modern industrial uses of each.	Chapter 7: Electricity and Magnetism 7.12 The Magnetic Force Page 158 7.13 Magnetic Fields Page 159-161 7.14 Magnetic Forces on Moving Charges Pages 162-163	

2018 Mississippi College- and Career-Readiness Standards for Science					
Book: Conceptual Integrated Science, ©2020					
Physical Science Standards **Total Standards: 9**					
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**	**Comments**
			PHS.9.3 Enrichment: Use an engineering design process to construct a working electric motor to perform a task. Communicate the design process and comparisons of task performance efficiencies.*	This topic is not covered in the text.	
			PHS.9.4 Use an engineering design process to construct and test conductors, semiconductors, and insulators using various materials to optimize efficiency.*	This topic is not covered in the text.	

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
PHY.1 One-Dimensional Motion	Linear motion of objects is described by displacement, velocity, and acceleration. These concepts should be introduced as computational and investigative phenomena.	PHY.1 Students will investigate and understand how to analyze and interpret data.	PHY.1.1 Investigate and analyze evidence gained through observation or experimental design regarding the one-dimensional (1-D) motion of objects. Design and conduct experiments to generate and interpret graphical evidence of distance, velocity, and acceleration through motion.	Partial coverage: Students learn about the concepts of velocity and acceleration and conduct experiments, but they do not generate and interpret graphical evidence. Chapter 3: Linear Motion 3.2 Velocity 3.3 Acceleration Chapter 3 Review: Think and Do (Hands-On Applications) Q 30, 31
			PHY.1.2 Interpret and predict 1-D motion based on displacement vs. time, velocity vs. time, or acceleration vs. time graphs (e.g., free-falling objects).	Partial coverage: Students learn about free-falling objects but do not interpret and predict linear motion based on graphs. Chapter 3: Linear Motion 3.4 Free Fall
			PHY.1.3 Use mathematical and computational analysis to solve	Chapter 3: Linear Motion 3.4 Free Fall

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			problems using kinematic equations.	Chapter 3 Review: Plug and Chug (Equation Familiarization) Q 37-40 Chapter 3 Review: Think and Solve (Mathematical Application) Q 41-44
			PHY.1.4 Use graphical analysis to derive kinematic equations.	The text does not cover this objective.
			PHY.1.5 Differentiate and give examples of motion concepts such as distance-displacement, speed-velocity, and acceleration.	Chapter 3: Linear Motion 3.5 Velocity Vectors Chapter 3 Review: Think and Solve (Mathematical Application) Q 45-49 Chapter 3 Review: Think and Discuss (Evaluation) Q 78-79, 82-84
			PHY.1.6 Design and mathematically/graphically analyze quantitative data to explore displacement,	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			velocity, and acceleration of various objects. Use probe systems, video analysis, graphical analysis software, digital spreadsheets, and/or online simulations.	
			PHY.1.7 Design different scenarios, and predict graph shapes for distance/time, velocity/time, and acceleration/time graphs.	The text does not cover this objective.
			PHY.1.8 Given a 1D motion graph students should replicate the motion predicted by the graph.	The text does not cover this objective.
PHY.2 Newton's Laws	Motion and acceleration can be explained by analyzing the contact interaction of objects. This motion and acceleration can be predicted by analyzing the forces (i.e., normal, tension, gravitational, applied, and frictional) acting on the	PHY.2 Students will develop an understanding of concepts related to Newtonian dynamics.	PHY.2.1 Identify forces acting on a system by applying Newton's laws mathematically and graphically (e.g., vector and scalar quantities).	Chapter 4: Newton's Second Law of Motion 4.1 Forces 4.2 Friction 4.3 Mass and Weight 4.4 Newton's Second Law of Motion 4.5 When Acceleration is g – Free Fall 4.6 When Acceleration is Less Than g – Nonfree Fall

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	object and applying Newton's laws of motion.			Chapter 4 Review: Think and Explain (Synthesis) Q 57, 60, 73, 74
			PHY.2.2 Use models such as free-body diagrams to explain and predict the motion of an object according to Newton's law of motion, including circular motion.	Chapter 4: Newton's Second Law of Motion 4.3 Mass and Weight 4.4 Newton's Second Law of Motion 4.5 When Acceleration is g – Free Fall 4.6 When Acceleration is Less Than g – Nonfree Fall Chapter 8: Rotational Motion 8.1 Circular Motion 8.2 Centripetal Force 8.3 Centrifugal Force 8.4 Rotational Inertia
			PHY.2.3 Use mathematical and graphical techniques to solve vector problems and find net forces acting on a body using free-body diagrams and/or online simulations.	Partial coverage: Students do not use diagrams or online simulations while solving problems related to this objective. Chapter 2: Newton's First Law of Motion-Inertia 2.4 Net Forces and Vectors 2.5 The Equilibrium Rule

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 2 Review: Reading Check Questions (Comprehension) Q 10-13 Chapter 2 Review: Think and Solve (Mathematical Application) Q 30, 31 Chapter 4: Newton's Second Law of Motion Chapter 4 Review: Reading Check Questions Q 22, 25, 26 Chapter 4 Review: Think and Explain (Synthesis) Q 73, 74, 75, 83, 87, 89 Chapter 4 Review: Think and Discuss (Evaluation) Q 113
			PHY.2.4 Use vectors and mathematical analysis to explore	Chapter 10: Projectile and Satellite Motion

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			the 2D motion of objects. (i.e. projectile and circular motion).	10.1 Projectile Motion 10.2 Fast-Moving Projectiles-Satellites 10.3 Circular Satellite Orbits Chapter 10 Review: Think and Explain (Synthesis) Q 45, 46, 47
			PHY.2.5 Use mathematical and computational analysis to derive simple equations of motion for various systems using Newton's second law (e.g. net force equations).	The text does not cover this objective.
			PHY.2.6 Use mathematical and computational analysis to explore forces (e.g., friction, force applied, normal, and tension).	Chapter 4: Newton's Second Law of Motion 4.1 Forces 4.2 Friction 4.3 Mass and Weight Chapter 4 Review: Think and Solve (Mathematical Application) Q 40, 41, 47, 50, 51 Chapter 4 Review: Think and Discuss (Evaluation)

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Q 102, 103, 106, 109, 110
			PHY.2.7 Analyze real-world applications to draw conclusions about Newton's three laws of motion using online simulations, probe systems, and/or laboratory experiences.	The text does not cover this objective.
			PHY.2.8 Design an experiment to determine the forces acting on a stationary object on an inclined plane. Test your conclusions.	The text does not cover this objective.
			PHY.2.9 Draw diagrams of forces applied to an object, and predict the angle of incline that will result in unbalanced forces acting on the object.	The text does not cover this objective.
			PHY.2.10 Apply the effects of the universal gravitation law to generate a digital/physical graph, and interpret the forces between two masses, acceleration due to gravity, and planetary motion (e.g., situations where g is constant, as in falling bodies).	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			PHY.2.11 Explain centripetal acceleration while undergoing uniform circular motion to explore Kepler's third law using online simulations, models, and/or probe systems.	Chapter 10: Projectile and Satellite Motion 10.3 Circular Satellite Orbits 10.5 Kepler's Laws of Planetary Motion Chapter 10 Review: Reading Check Questions (Comprehension) Q 13 Chapter 10 Review: Think and Explain (Synthesis) Q 53, 59
PHY.3 Work and Energy	Work and energy are synonymous. When investigating mechanical energy, energy is the ability to do work. The rate at which work is done is called power. Efficiency is the ratio of power input to the output of the system. In closed systems, energy is conserved.	PHY.3 Students will develop an understanding of concepts related to work and energy.	PHY.3.1 Use mathematical and computational analysis to qualitatively and quantitatively analyze the concept of work, energy, and power to explain and apply the conservation of energy.	Chapter 7: Energy 7.1 Work 7.2 Power 7.3 Potential Energy 7.4 Kinetic Energy 7.6 Conservation of Energy Chapter 7 Review: Plug and Chug (Equation Familiarization) Q 39, 40, 43 Chapter 7 Review: Think and Solve (Mathematical Application)

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Q 49, 50, 51, 55, 56 Chapter 7 Review: Think and Explain (Synthesis) Q 62, 64, 65, 66, 69, 71, 74, 75, 76, 93
			PHY.3.2 Use mathematical and computational analysis to explore conservation of momentum and impulse.	Chapter 6: Momentum 6.1 Momentum 6.2 Impulse 6.5 Conservation of Momentum Chapter 6 Review: Reading Check Questions (Comprehension) Q 14-17 Chapter 6 Review: Plug and Chug (Equation Familiarization) Q 36, 37 Chapter 6 Review: Think and Solve (Mathematical Application) Q 45
			PHY.3.3 Through real-world applications, draw conclusions about mechanical potential	Chapter 7: Energy 7.3 Potential Energy 7.4 Kinetic Energy

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			energy and kinetic energy using online simulations and/or laboratory experiences.	Chapter 7 Review: Think and Explain (Synthesis) Q 61, 76, 77
			PHY.3.4 Design and conduct investigations to compare conservation of momentum and conservation of kinetic energy in perfectly inelastic and elastic collisions using probe systems, online simulations, and/or laboratory experiences.	The text does not cover this objective.
			PHY.3.5 Investigate, collect data, and summarize the principles of thermodynamics by exploring how heat energy is transferred from higher temperature to lower temperature until equilibrium is reached.	Chapter 18: Thermodynamics 18.5 Second Law of Thermodynamics Chapter 18 Review: Think and Do (Hands-On Applications) Q 32
			PHY.3.6 Enrichment: Design, conduct, and communicate investigations that explore how temperature and thermal energy	Chapter 18: Thermodynamics 18.5 Second Law of Thermodynamics Chapter 18 Review: Think and Do (Hands-On Applications)

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			relate to molecular motion and states of matter.	Q 32
			PHY.3.7 Enrichment: Use mathematical and computational analysis to analyze problems involving specific heat and heat capacity.	Chapter 15: Temperature, Heat, and Expansion 15.3 Specific Heat Capacity Chapter 15 Review: Think and Solve (Mathematical Application) Q 33-35
			PHY.3.8 Enrichment: Research to compare the first and second laws of thermodynamics as related to heat engines, refrigerators, and thermal efficiency.	Partial coverage: Students do not conduct research on this topic. Chapter 18: Thermodynamics Chapter 18 Review: Think and Solve (Mathematical Application) Q 41 Chapter 18 Review: Think and Discuss (Evaluation) Q 79, 80, 88
			PHY.3.9 Explore the kinetic theory in terms of kinetic energy of ideal gases using digital resources.	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			PHY.3.10 Enrichment: Research the efficiency of everyday machines (e.g., automobiles, hair dryers, refrigerators, and washing machines).	Partial coverage: Students do not conduct research to answer these questions. Chapter 18: Thermodynamics 18.5 Second Law of Thermodynamics Chapter 18 Review: Think and Discuss (Evaluation) Q 79, 80
			PHY.3.11 Enrichment: Use an engineering design process to design and build a themed Rube Goldberg-type machine that has six or more steps and complete a desired task (e.g., pop a balloon, fill a bottle, shoot a projectile, or raise an object 35 cm) within an allotted time. Include a poster that demonstrates the calculations of the energy transformation or efficiency of the machine.*	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
PHY.4 Waves	Wave properties are the transfer of energy from one place to another. The investigation of these interactions must include simple harmonic motion, sound, and electromagnetic radiation.	PHY.4 Students will investigate and explore wave properties.	PHY.4.1 Analyze the characteristics and properties of simple harmonic motions, sound, and light.	Chapter 19: Vibrations and Waves 19.1 Good Vibrations (Vibration of a Pendulum – SHM) 19.2 Wave Description 19.3 Wave Motion 19.4 Wave Speed 19.5 Wave Interference Chapter 19 Review: Think and Discuss (Evaluation) Q 51, 54-57, 61, 63, 64, 67 Chapter 20: Sound 20.2 Sound in Air 20.3 Reflection of Sound 20.4 Refraction of Sound 20.5 Forced Vibrations 20.6 Resonance 20.7 Interference Chapter 20 Review: Think and Discuss (Evaluation) Q 51, 52, 54, 57, 58, 60, 61, 63, 66, 74, Chapter 26: Properties of Light

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				26.2 Electromagnetic Wave Velocity Chapter 26 Review: Think and Discuss (Evaluation) Q 46, 47, 50, 63
			PHY.4.2 Describe and model through digital or physical means the characteristics and properties of mechanical waves by simulating and investigating properties of simple harmonic motion.	Chapter 19: Vibrations and Waves Chapter 19 Review: Think and Do (Hands-On Applications) Q 32
			PHY.4.3 Use mathematical and computational analysis to explore wave characteristics (e.g., velocity, period, frequency, amplitude, phase, and wavelength).	Chapter 19: Vibrations and Waves Chapter 19 Review: Think and Solve (Mathematical Application) Q 39, 41, 42 Chapter 20: Sound Chapter 20 Review: Think and Solve (Mathematical Application) Q 35, 36, 40, 41 Chapter 26: Properties of Light Chapter 26 Review: Think and Solve (Mathematical Application)

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Q 37-39
			PHY.4.4 Investigate and communicate the relationship between the energy of a wave in terms of amplitude and frequency using probe systems, online simulations, and/or laboratory experiences.	The text does not cover this objective.
			PHY.4.5 Design, investigate, and collect data on standing waves and waves in specific media (e.g., stretched string, water surface, and air) using online simulations, probe systems, and/or laboratory experiences.	Chapter 19: Vibrations and Waves Chapter 19 Review: Think and Do (Hands-On Applications) Q 31
			PHY.4.6 Explore and explain the Doppler effect as it relates to a moving source and to a moving observer using online simulations, probe systems, and/or real-world experiences.	Chapter 19: Vibrations and Waves 19.6 Doppler Effect Chapter 19 Review: Think and Explain (Synthesis) Q 72-76
			PHY.4.7 Explain the laws of reflection and refraction, and apply Snell's law to describe the	Chapter 28: Reflection and Refraction 28.2 Law of Reflection 28.3 Refraction 28.5 Dispersion

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			relationship between the angles of incidence and refraction.	Chapter 28 Review: Reading Check Questions (Comprehension) Q 4, 8, 9, 11, 12, 16
			PHY.4.8 Use ray diagrams and the thin lens equations to solve real-world problems involving object distance from lenses, using a lens bench, online simulations, and/or laboratory experiences.	Chapter 28: Reflection and Refraction Chapter 28 Review: Think and Solve (Mathematical Application) Q 38 Chapter 28 Review: Think and Explain (Synthesis) Q 80
			PHY.4.9 Research the different bands of electromagnetic radiation, including characteristics, properties, and similarities/differences.	Partial coverage: Students do not conduct research on this topic. Chapter 26: Properties of Light 26.3 The Electromagnetic Spectrum Chapter 26 Review: Think and Explain (Synthesis) Q 48, 51, 52, 53, 54, 56, 57, 58, 60, 61
			PHY.4.10 Enrichment: Research the ways absorption and emission spectra are used to	Partial coverage: Students do not conduct research on this topic. Chapter 30: Light Emission

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			study astronomy and the formation of the universe.	30.3 Emission Spectra 30.5 Absorption Spectra Chapter 30 Review: Think and Explain (Synthesis) Q 45, 66, 67 Chapter 30 Review: Think and Discuss (Evaluation) Q 78, 79
			PHY.4.11 Enrichment: Research digital nonfictional text to defend the wave-particle duality of light (i.e., wave model of light and particle model of light).	The text does not cover this objective.
			PHY.4.12 Enrichment: Research uses of the electromagnetic spectrum or photoelectric effect.	Chapter 31: Light Quanta Chapter 31 Review: Think and Explain (Synthesis) Q 51, 52
PHY.5 Electricity and Magnetism	In electrical interactions, electrical energy (whether battery or circuit energy) is transformed into other forms of energy. Charged	PHY.5 Students will investigate the key components of electricity and magnetism.	PHY.5.1 Analyze and explain electricity and the relationship between electricity and magnetism.	Chapter 25: Electromagnetic Induction 25.1 Electromagnetic Induction Chapter 25 Review: Think and Discuss (Evaluation)

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
	particles and magnetic fields are similar in that they store energy. Magnetic fields exert forces on moving charged particles. Changing magnetic fields cause electrons in wires to move and thus create a current.			Q 99, 100
			PHY.5.2 Explore the characteristics of static charge and how a static charge is generated using simulations.	Partial coverage: Students conduct hands-on activities to generate static charge, but do not use simulations. Chapter 22: Electrostatics 22.3 Conservation of Charge Chapter 22 Review: Hands-On Applications Q 31, 32, 34
			PHY.5.3 Use mathematical and computational analysis to analyze problems dealing with electric field, electric potential, current, voltage, and resistance as related to Ohm's law.	Chapter 22: Electrostatics Chapter 22 Review: Think and Solve (Mathematical Application) Q 42-46 Chapter 23: Electric Current

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
				Chapter 23 Review: Think and Solve (Mathematical Application) Q 40, 41
			PHY.5.4 Develop and use models (e.g., circuit drawing and mathematical representation) to explain how electric circuits work by tracing the path of electrons, including concepts of energy transformation, transfer, conservation of energy, electric charge, and resistance using online simulations, probe systems, and/or laboratory experiences.	Partial coverage: Students do not develop circuit drawings or use online simulations, probe systems or lab experiences. They solve problems based on circuit drawings given in the text. Chapter 23: Electric Current 23.8 Electric Circuits Chapter 23 Review: Think and Discuss (Evaluation) Q 99, 100
			PHY.5.5 Design and conduct an investigation of magnetic poles, magnetic flux and magnetic field using online simulations, probe systems, and/or laboratory experiences.	Chapter 24: Magnetism 24.2 Magnetic Poles 24.3 Magnetic Field Chapter 24 Review: Think and Do (Hands-On Applications) Q 31-35
			PHY.5.6 Use schematic diagrams to analyze the current flow in	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards Total Standards: 9				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			series and parallel electric circuits, given the component resistances and the imposed electric potential.	
			PHY.5.7 Analyze and communicate the relationship between magnetic fields and electrical current by induction, generators, and electric motors (e.g., microphones, speakers, generators, and motors) using Ampere's and Faraday's laws.	Partial coverage: The text does not cover Ampere's law. Chapter 25: Electromagnetic Induction 25.2 Faraday's Law Chapter 25 Review: Think and Explain (Synthesis) Q 47-49, 57, 65, 66
			PHY.5.8 Enrichment: Design and construct a simple motor to develop an explanation of how the motor transforms electrical energy into mechanical energy and work.	Partial coverage: Students learn about simple motors but do not design or construct them. Chapter 24: Magnetism 24.7 Magnetic Forces
			PHY.5.9 Enrichment: Design and draw a schematic of a circuit that will turn on/off a light from two locations in a room like those found in most homes.	The text does not cover this objective.

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
PHY.6 Nuclear Energy	Nuclear energy is energy stored in the nucleus of the atom. The energy holding atoms together is called binding energy. The binding energy is a huge amount of energy. So, at the subatomic scale, the conservation of energy becomes the conservation of mass-energy.	PHY.6 Students will demonstrate an understanding of the basic principles of nuclear energy.	PHY.6.1 Analyze and explain the concepts of nuclear physics.	Chapter 34: Nuclear Fission and Fusion 34.1 Nuclear Fission 34.6 Nuclear Fusion
			PHY.6.2 Explore the mass number and atomic number of the nucleus of an isotope of a given chemical element.	Chapter 11: The Atomic Nature of Matter 11.5 Isotopes Chapter 33: The Atomic Nucleus and Radioactivity Chapter 33 Review: Think and Explain (Synthesis) Q 60, 68
			PHY.6.3 Investigate the conservation of mass and the conservation of charge by writing and balancing nuclear decay	Chapter 33: The Atomic Nucleus and Radioactivity 33.8 Transmutation of Elements

2018 Mississippi College- and Career-Readiness Standards for Science				
Book: Conceptual Physics, ©2022				
Physics Standards **Total Standards: 9**				
Disciplinary Core Idea	**Conceptual Understanding**	**Content Standard**	**Breakout**	**Citations**
			equations for alpha and beta decay.	The following questions do not explicitly ask students to write balanced equations for alpha and beta decay, but they may do so to answer the questions. Chapter 33 Review: Think and Explain (Synthesis) Q 72-74
			PHY.6.4 Simulate the process of nuclear decay using online simulations and/or laboratory experiences and using mathematical computations determine the half-life of radioactive isotopes.	Chapter 33: The Atomic Nucleus and Radioactivity Chapter 33 Review: Think and Solve (Mathematical Application) Q 35-38

Objectives identified by “Enrichment:” are considered enrichment material that may be expanded upon as time permits. Engineering standards are represented in some performance objectives with specific wording that will prompt students to approach learning and exploration using the engineering process. These performance objectives are marked with an * at the end of the statement.

Technology Supporting Document

Mississippi Requirement	MyLab/Mastering	Bookshelf by VitalSource (etext for CTE titles)
Technology Supporting Document includes the Learning Management System (LMS) and its hardware and software capabilities. The document should include the following information:	n/a	n/a
i. Thin Common Cartridge 1.3 – IEDTECH Global Standards	We don't specifically support Thin Common Cartridge. When Pearson is integrated with an LMS using our LTI 1.3 app, the instructor can create deeplinks which are an external tool item. These can potentially be imported and exported in Thin Common Cartridge files. However, this is not a typical part of the workflow for creating or copying Pearson courseware.	Thin common cartridge employs LTI, which is fully supported.
ii. School rostering	Users are rostered into the Pearson courseware when they access their Pearson product for the first time. If the Pearson courseware is integrated with an LMS, the user will have a Pearson account created for them in most circumstances. We take the email address associated with the LMS account and make that the Pearson username, but if that username already exists in our system then we can't automatically create the account, and we ask the user to log in or create a new account instead. This is usually only a concern if the school district recycles email addresses. Returning students will be recognized by their LMS credentials and passed to their preexisting Pearson account. The experience is completely SSO after the Pearson account is successfully created and matched with the LMS account.	Rostering via LTI is fully supported.
iii. PDF and/or ePUB format	Pearson eTexts use our own format and browser. Alternative file types may be available for users with accessibility needs. Some products may include supplemental materials in PDF format.	EPUB is preferred for accessibility, but tagged PDF's will also work.

iv. Alternative text (image), captions and subtitles (videos), read-alouds, and other accessibility functions	Pearson works closely with key members of the disability and advocacy community who are committed to accessible instructional materials. We work with organizations such as W3C, the DIAGRAM Center, Book Industry Study Group, the Center for Accessible Materials Innovation, and the EDUPUB Alliance (EPUB for Education). Pearson is pleased to announce our collaboration with the Book Industry Study Group to promote the launch of Quick Start Guide to Accessible Publishing. Pearson staff contribute time, expertise, and creativity to moving accessibility forward. We conduct user studies and a variety of research and usability studies on important topics, such as assistive technology use, and on product prototypes. We collaborate with advocacy groups and share advances and insights through conference presentations. Students can now instantly purchase accessible digital textbooks for select Pearson titles, providing affordable, faster, and more efficient access to their learning materials. Alternate text files for other Pearson titles are available for qualified students upon request and at no added cost, provided the student has purchased or is renting the print or digital textbook. All other requests can be placed using Pearson's disability request form. Please understand that it may take up to 10 business days for you to receive the electronic file. https://www.pearson.com/en-us/legal-information/accessibility.html	Pearson works closely with key members of the disability and advocacy community who are committed to accessible instructional materials. We work with organizations such as W3C, the DIAGRAM Center, Book Industry Study Group, the Center for Accessible Materials Innovation, and the EDUPUB Alliance (EPUB for Education). Pearson is pleased to announce our collaboration with the Book Industry Study Group to promote the launch of Quick Start Guide to Accessible Publishing. Pearson staff contribute time, expertise, and creativity to moving accessibility forward. We conduct user studies and a variety of research and usability studies on important topics, such as assistive technology use, and on product prototypes. We collaborate with advocacy groups and share advances and insights through conference presentations. Students can now instantly purchase accessible digital textbooks for select Pearson titles, providing affordable, faster, and more efficient access to their learning materials. Alternate text files for other Pearson titles are available for qualified students upon request and at no added cost, provided the student has purchased or is renting the print or digital textbook. All other requests can be placed using Pearson's disability request form. Please understand that it may take up to 10 business days for you to receive the electronic file. https://www.pearson.com/en-us/legal-information/accessibility.html and https://accessibility.vitalsource.com
v. 508 compliant platform	We gratefully acknowledge and endorse the work of the Web Accessibility Initiative of the World Wide Web consortium on the Web Content Accessibility Guidelines (WCAG) 2.2, as well as the work of United States Access Board and the Information Technology Advisory Committee (TEITAC) on their Section 508 Refresh Drafts. We strive to provide equal access for all students. To achieve this goal, we've created the Pearson Accessibility Guidelines for eLearning. These guidelines provide developers standards for creating the most effective educational content. https://www.pearson.com/en-us/legal-information/accessibility.html	We gratefully acknowledge and endorse the work of the Web Accessibility Initiative of the World Wide Web consortium on the Web Content Accessibility Guidelines (WCAG) 2.2, as well as the work of United States Access Board and the Information Technology Advisory Committee (TEITAC) on their Section 508 Refresh Drafts. We strive to provide equal access for all students. To achieve this goal, we've created the Pearson Accessibility Guidelines for eLearning. These guidelines provide developers standards for creating the most effective educational content. https://www.pearson.com/en-us/legal-information/accessibility.html and https://accessibility.vitalsource.com
vi. Privacy-data security specifications	Pearson's privacy and data security specifications are linked here: https://www.pearson.com/en-us/privacy-center/privacy-notices.html	Vitalsource's privacy and data security specifications are linked here: https://www.pearson.com/en-us/privacy-center/privacy-notices.html and https://vitalsource.com/privacy

vii. Browser and OS support	Browser & OS Support Information can be found here: https://support.pearson.com/getsupport/s/article/Using-an-Alternate-Supported-Browser	Browser and OS Support Information can be found here: https://bookshelfsupport.vitalsource.com/hc/en-us/sections/32270458995095
b. LMS is a generic term for platforms like Canvas, Google, and Schoology. A software platform designed to manage, deliver, and track educational courses, training programs, or learning and development initiatives. It provides educators with tools to create and organize content, manage student enrollments, track progress, assess performance, and facilitate communication between instructors and learners. LMSs often include discussion forums, assignment submissions, quizzes, grading, and reporting.	Our LTI 1.3 app is available for Canvas, Schoology, Blackboard, Brightspace/D2L, Moodle and Sakai. We can also integrate with Clever and Classlink, but we would suggest integrating with one of the LMSes listed instead because those integrations have a bigger feature set, most notably grade sync.	Yes, Vitalsource is compatible with and can integrate with ClassGather.
c. ClassGather offers customers access to their digital instructional materials through direct integrations with publisher platforms. As a certified integration partner, ClassGather supports roster exchange with publishers via OneRoster (CSV or API) and SSO access via SAML, oAuth, or LTI. Through automated resource assignment, access to digital titles is provisioned at the time of purchase, so student and teacher access “just works” without additional content or integration configuration.	We don't currently integrate with ClassGather.	Yes, Vitalsource is compatible with and can integrate with ClassGather.