Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 1 The Study of Life
Chapter Question: What is biology?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 5-6 Lesson 3 SE: 18-20	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #2 SE: 11-14 Lesson #3 SE: 20 Chapter end 23	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #2 SE: 11-14 Lesson 3 SE: 16-20 Chapter end 23	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 16-20 Chapter end 23	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #3 SE: 20 Chapter end 23	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #2 SE: 11-14 Lesson 3 SE: 20 Chapter end 23	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #3 SE: 20 Chapter end 23	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.

Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #2 SE:11-14 Lesson 3 SE: 20 Chapter end 23	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #3 SE: 20 Chapter end 23	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #2 SE: 11-14 Lesson #3 SE: 20 Chapter end 23	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Lesson #2 SE: 14 Lesson #3 SE: 20 Chapter end 23	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #3 SE: 20 Chapter end 23	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #3 SE: 21	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Essential Questions: • What are the characteristics of living things? • What types of questions can be tested? • What is the scientific method?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 2 Principles of Ecology**

Chapter Question: **What are the relationships among organisms, and how does energy and material flow through an ecosystem?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 31 Lesson #1 SE: 39 Lesson 2 SE: 42 Lesson 3 SE: 48 Chapter end 51	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 31 Lesson #1 SE: 29 Lesson #2 SE: 42 Lesson #3 SE: 48 Chapter end 51	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter opener 31 Lesson #1 SE: 39 Lesson #2 SE: 42 Lesson #3 SE: 48 Chapter end 51	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Chapter opener 31 Lesson #1 SE: 39 Lesson #3 SE: 48 Chapter end 51	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.

Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 31 Lesson #1 SE: 39 Lesson #3 SE: 48 Chapter end 51	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter opener 31 Lesson #1 SE: 39 Chapter end 51	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter opener 31 Lesson #1 SE: 39 Chapter end 51	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter opener 31 Lesson #1 SE: 39 Chapter end 51	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter opener 31 Lesson #1 SE: 39 Chapter end 51	Use data representations and new models to revise predictions and explanations.

Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #1 SE: 39 Chapter end 51	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 50, 51	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #2 SE: 42 Chapter end 51	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 31 Lesson #3 SE: 48 Chapter end 51	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #2 SE: 41-44 Lesson #3 SE: 45-49	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.

Content Statement: Each recombination of matter and energy results in storage and dissipation of energy into the environment as heat.	
5.3.12.B.2 Lesson #2 SE: 43, 44	Use mathematical formulas to justify the concept of an efficient diet.
Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #2 SE: 41, 42, 44	Predict what would happen to an ecosystem if an energy source was removed.
Content Statement: Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	
5.3.12.B.4 Lesson #2 SE: 41, 43 Lesson #3 SE: 47	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Lesson #2 SE: 41, 43 Lesson #3 SE: 47	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.
Content Statement: All organisms must break the high-energy chemical bonds in food molecules during cellular respiration to obtain the energy needed for life processes.	
5.3.12.B.6 Lesson #2 SE: 41, 43 Lesson #3 SE: 47	Explain how the process of cellular respiration is similar to the burning of fossil fuels.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 35, 38-40 Lesson #2 SE: 42-43	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.

Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Chapter opener 31 Lesson #1 SE: 35, 39 Lesson #2 SE: 42 Chapter end 50	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Essential Questions: • How do organisms interact with one another and with their environment? • How does energy flow through the ecosystem? • How does matter flow through the ecosystem?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 3 Communities, Biomes, and Ecosystems

Chapter Question: What determines where terrestrial biomes and aquatic ecosystems exist?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 63 Lesson #2 SE: 66 Chapter end 83	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 63 Lesson 2 SE: 66 Chapter end 83	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 83	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 63 Chapter end 83	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 66 Chapter end 83	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 63 Lesson #2 SE: 66 Chapter end 83	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 63 Chapter end 83	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 83	Reflect on and revise understandings as new evidence emerges.

Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 83	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 83	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 59 Lesson #3 SE: 77 Chapter end 82	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #3 SE: 77 Chapter end 83	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter end 83	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities)**,** and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Chapter end 83	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.

Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Chapter end 83	Predict what would happen to an ecosystem if an energy source was removed.
Content Statement: Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	
5.3.12.B.4 Chapter end 83	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Chapter end 83	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Chapter end 83	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Chapter opener 59 Lesson #1 SE: 62-64 Chapter end 83	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Essential Questions: • How do abiotic and biotic factors affect communities? • What are the major terrestrial biomes and what factors determine their distribution? • What are the major aquatic ecosystems and what are their major characteristics?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 4 Population Ecology**

Chapter Question: **How is population growth affected by abiotic and biotic factors?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 98 Lesson #2 SE: 101	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 98 Lesson #2 SE: 101	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 107	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 98 Lesson #2 SE: 101 Chapter end 107	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 98 Chapter end 107	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 98 Lesson #2 SE: 101 Chapter end 107	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 107	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 107	Reflect on and revise understandings as new evidence emerges.

Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 107	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 107	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 91 Chapter end 106, 107	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 91 Chapter end 106, 107	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 107	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 94-96, 98	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.

Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #1 SE: 94-96, 98 Lesson #2 SE: 100-105 Chapter end 107	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Essential Questions: • What is a population, and what factors limit population growth? • How are the trends in human population growth?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 5 Biodiversity and Conservation

Chapter Question: How does diversity contribute to the stability of communities and ecosystems?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #2 SE: 127 Lesson #3 SE: 131 Chapter end 137	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 115 Lesson #2 SE: 127 Lesson #3 131 Chapter end 137	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter opener 115 Lesson #2 SE: 127 Chapter end 137	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #2 SE: 127 Lesson #3 SE: 131 Chapter end 137	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 127 Chapter end 137	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #2 SE: 127 Chapter end 137	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.

Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #2 SE: 127 Chapter end 137	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #2 SE: 127 Chapter end 137	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #2 SE: 127 Chapter end 137	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #2 SE: 127 Chapter end 137	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 115 Lesson #1 SE: 120 Chapter end 137	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 120 Chapter end 137	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #2 SE: 127 Chapter end 137	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 116-118 Chapter end 137	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #1 SE: 120 Lesson #2 SE: 123-128 Lesson #3 SE: 130	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Essential Questions: • What is biodiversity, and why is it important? • What are current threats to biodiversity? • How can biodiversity be preserved?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 6 Chemistry in Biology

Chapter Question: What are the building blocks of all living organisms?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #2 SE: 159 Lesson #3 SE: 164 Chapter end 173	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #2 SE: 159 Lesson #3 SE: 164 Chapter end 173	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #2 SE: 159 Lesson #3 SE: 164 Chapter end 173	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 164 Lesson #4 SE: 169 Chapter end 173	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter end 173	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #2 SE: 159 Chapter end 173	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #2 SE:159 Chapter end 173	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.

Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter opener 147 Lesson #2 SE:159 Lesson #4 SE: 169 Chapter end 173	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter opener 147 Lesson #2 SE:159 Lesson #4 SE: 169 Chapter end 173	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 173	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 173	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 147 Chapter end 173	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 154 Lesson 2 SE: 159 Chapter end 173	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cells are made of complex molecules that consist mostly of a few elements. Each class of molecules has its own building blocks and specific functions.	
5.3.12.A.1 Lesson #4 SE: 166-171	Represent and explain the relationship between the structure and function of each class of complex molecules using a variety of models.
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #2 SE: 159-160 Chapter end 173	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #3 SE: 165 Chapter end 172, 173	Predict a cell's response in a given set of environmental conditions.

Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #2 SE: 157	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: All organisms must break the high-energy chemical bonds in food molecules during cellular respiration to obtain the energy needed for life processes.	
5.3.12.B.6 Lesson #2 SE: 157	Explain how the process of cellular respiration is similar to the burning of fossil fuels.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Chapter end 172	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Essential Questions: • What are atoms, elements, and compounds? • What energy changes take place in chemical reactions? • What are the characteristics of water? • What are the four groups of carbon-based macromolecules in living things?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 7 Cellular Structure and Function**

Chapter Question: **What are cells?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 181 Lesson #1 SE: 184 Lesson #2 SE: 189 Lesson #3 SE 194 Lesson #4 SE: 203 Chapter end 209	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 181 Lesson #4 SE: 203 Chapter end 209	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #4 SE: 203 Chapter end 209	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #2 SE: 189 Lesson #3 SE: 194 Lesson #4 SE: 203 Chapter end 209	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 181 Lesson #4 SE: 203 Chapter end 209	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter opener 181 Lesson #4 SE: 203 Chapter end 209	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.

Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #4 SE: 203 Chapter end 209	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #4 SE: 203 Chapter end 209	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #4 SE: 203 Chapter end 209	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 209	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 209	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 181 Lesson #1 SE: 184 Chapter end 209	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #4 SE: 203 Chapter end 209	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #4 SE: 202-205 Chapter end 209	Predict a cell's response in a given set of environmental conditions.
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	
5.3.12.B.4 Lesson #3 SE: 197	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Lesson #3 SE: 197	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.
Essential Questions: • How did the invention of the microscope lead to the cell theory? • What is the role of the plasma membrane? • What are organelles, and what is the role of the various organelles in eukaryotic cells? • What forms of cellular transport move substances into and out of the cell?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 8 Cellular Energy**

Chapter Question: **What are photosynthesis and cellular respiration?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 217 Lesson #1 SE: 220 Lesson #3 SE: 232 Chapter end 234	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 217 Lesson #1 SE: 220 Lesson #3 SE: 232 Chapter end 234	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 220 Chapter end 234	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Chapter opener 217 Lesson #1 SE: 220 Lesson #3 SE: 232 Chapter end 235	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 217 Lesson #1 SE: 220 Lesson #3 SE: 232 Chapter end 235	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.

Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 200 Lesson #3 SE: 232 Chapter end 235	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter opener 217 Lesson #1 SE: 220 Chapter end 235	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #1 SE: 220 Chapter end 235	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #1 SE: 220 Chapter end 235	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 235	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 235	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.

Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 217 Lesson #1 SE: 220 Lesson 2 SE: 223 Chapter end 235	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 217 Lesson #1 SE: 220 Lesson 2 SE: 223 Chapter end 235	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Chapter opener 217 Lesson #1 SE: 219-220 Lesson 3 SE: 233	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Each recombination of matter and energy results in storage and dissipation of energy into the environment as heat.	
5.3.12.B.2 Chapter opener 217 Lesson #1 SE: 219	Use mathematical formulas to justify the concept of an efficient diet.

Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #1 SE: 220	Predict what would happen to an ecosystem if an energy source was removed.
Content Statement: Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	
5.3.12.B.4 Lesson #1 SE: 220 Lesson #2 SE: 222-227 Chapter end 235	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Lesson #1 SE: 220 Lesson #2 SE: 222-227 Lesson 3 SE: 228-233	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.
Content Statement: All organisms must break the high-energy chemical bonds in food molecules during cellular respiration to obtain the energy needed for life processes.	
5.3.12.B.6 Lesson #1 SE: 220 Lesson #3 Se: 228-230	Explain how the process of cellular respiration is similar to the burning of fossil fuels.
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Chapter end 234	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Essential Questions: • Why do organisms need energy? • How is light energy converted into chemical energy in photosynthesis? • How is energy released from the breakdown of organic molecules in cellular respiration?	

Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 9 Cellular Reproduction
Chapter Question: What is the cell life cycle?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 243 Lesson #1 SE: 245 Chapter end 259	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 243 Lesson #1 SE: 245 Lesson #3 SE: 245 Chapter end 259	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #3 SE: 255 Chapter end 259	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 245 Lesson #3 SE: 255 Chapter end 259	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 243 Lesson #1 SE: 245 Lesson #3 SE: 255 Chapter end 259	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 245 Lesson #3 SE: 255 Chapter end 259	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #3 SE: 255 Chapter end 259	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.

Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter opener 243 Lesson #1 SE: 245 Lesson #3 SE: 255 Chapter end 259	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter opener 243 Lesson #1 SE: 245 Lesson #3 SE: 255 Chapter end 259	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter opener 243 Lesson #1 SE: 245 Lesson #3 SE: 255 Chapter end 259	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Lesson #3 SE: 255	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.

Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 243 Lesson #2 SE: 251 Chapter end 258, 259	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 243 Chapter end 259	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Chapter end 259	Predict a cell's response in a given set of environmental conditions.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Chapter opener 243 Lesson #1 SE: 246-247 Lesson #2 SE: 248-252 Lesson #3 SE: 256-257 Chapter end 258	Distinguish between the processes of cellular growth (cell division) and development (differentiation).

Content Statement: Cell differentiation is regulated through the expression of different genes during the development of complex multicellular organisms.	
5.3.12.A.5 Lesson #3 SE: 256-257 Chapter end 258	Describe modern applications of the regulation of cell differentiation and analyze the benefits and risks (e.g., stem cells, sex determination).
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #3 SE: 254-255	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Essential Questions: • What factors limit the size of cells and what happens when that limit is reached? • What are the roles of mitosis and cytokinesis in the cell cycle? • What is the role of cyclin proteins in regulation of the cell cycle?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 10 Sexual Reproduction and Genetics**

Chapter Question: **How are reproductive cells produced by meiosis?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 269 Lesson #1 SE: 274 Lesson #2 SE: 281 Lesson #3 SE: 284 Chapter end 287	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 269 Lesson #1 SE: 274 Lesson #2 SE: 281 Lesson #3 SE: 284 Chapter end 287	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #3 SE: 284 Chapter end 287	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 274 Lesson #2 SE: 281 Chapter end 287	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 274 Lesson #2 SE: 281 Lesson #3 SE: 284 Chapter end 287	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.

Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 274 Lesson #2 SE: 281 Lesson #3 SE: 284 Chapter end 287	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 274 Lesson #2 SE: 281 Lesson #3 SE: 284 Chapter end 287	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter opener 269 Lesson #3 SE: 284 Chapter end 287	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter opener 269 Lesson #3 SE: 284 Chapter end 287	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter opener 269 Lesson #3 SE: 284 Chapter end 287	Consider alternative theories to interpret and evaluate evidence-based arguments.

Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 287	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #2 SE: 281 Lesson #3 SE: 285 Chapter end 287	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter end 287	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Chapter opener 269 Lesson #1 SE: 270-276 Lesson #2 SE: 278-282 Lesson #3 SE: 283-285 Chapter end 286, 287	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).

Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Lesson #1 SE: 276	Account for the appearance of a novel trait that arose in a given population.
Essential Questions: • How are haploid gametes formed by meiosis? • What are the principles of Mendelian genetics? • How does crossing over enhance genetic variation?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 11 Complex Inheritance and Human Heredity**

Chapter Question: **Does human inheritance always follow Mendelian principles?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 299-300 Lesson #2 SE: 303 Lesson #3 SE: 314 Chapter end 317	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 300 Lesson #3 SE: 314 Chapter end 317	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #3 SE: 314 Chapter end 317	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 300 Lesson #2 SE: 303 Lesson #4 SE: 314 Chapter end 317	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 300 Lesson #4 SE: 314 Chapter end 317	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 300 Lesson #4 SE: 314	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.

Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #4 SE: 314 Chapter end 317	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter opener 295 Chapter end 317	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 317	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter opener 295 Chapter end 317	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 295 Lesson #3 SE: 314 Chapter end 316	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 300 Chapter end 317	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #3 SE: 314	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #1 SE: 296-298 Lesson #2 SE: 303, 308	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Genes are segments of DNA molecules located in the chromosome of each cell. DNA molecules contain information that determines a sequence of amino acids, which result in specific proteins.	
5.3.12.D.1 Lesson #3 SE: 314-315 Chapter end 316	Explain the value and potential applications of genome projects.
Content Statement: Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	
5.3.12.D.2 Lesson #3 SE: 313-314	Predict the potential impact on an organism (no impact, significant impact) given a change in a specific DNA code, and provide specific real world examples of conditions caused by mutations.

Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 299-301 Lesson #2 SE: 302-305, 307-309 Lesson #3 SE: 314 Chapter end 317	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).

Essential Questions:

- How can a pedigree be used to track human genetic disorders over several generations?
- What are some complex patterns of inheritance found in human heredity?
- How can karyotypes be used to study chromosomes?

Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 12 Molecular Genetics
Chapter Question: What is DNA?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 331 Lesson #2 SE: 334 Lesson #3 SE: 340 Lesson #4 SE: 348	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 331 Lesson 2 SE: 334	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 351	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 340 Lesson #4 SE: 348	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 331 Lesson #2 SE: 334	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #3 SE: 340 Lesson #4 SE: 348	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 351	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.

Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #1 SE: 331	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #1 SE: 331	Use data representations and new models to revise predictions and explanations.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 325 Lesson #1 SE: 331 Lesson #2 SE: 334 Chapter end 350, 351	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 325	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter end 351	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cells are made of complex molecules that consist mostly of a few elements. Each class of molecules has its own building blocks and specific functions.	
5.3.12.A.1 Lesson #1 SE: 329-332 Lesson #2 SE: 333-335 Lesson #3 SE: 338-339	Represent and explain the relationship between the structure and function of each class of complex molecules using a variety of models.
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #1 SE: 333-334 Lesson #2 SE: 337 Lesson #3 SE: 339 Lesson #4 SE: 342-343, 345	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #3 SE: 340 Lesson #4 SE: 342-343, 348-349	Predict a cell's response in a given set of environmental conditions.

Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #2 SE: 333 Lesson #4 SE: 344, 349	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Content Statement: Cell differentiation is regulated through the expression of different genes during the development of complex multicellular organisms.	
5.3.12.A.5 Lesson #4 SE: 344-345	Describe modern applications of the regulation of cell differentiation and analyze the benefits and risks (e.g., stem cells, sex determination).
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #4 SE: 345-348	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Genes are segments of DNA molecules located in the chromosome of each cell. DNA molecules contain information that determines a sequence of amino acids, which result in specific proteins.	
5.3.12.D.1 Lesson #1 SE: 330-331 Lesson #3 SE: 336-341 Lesson #4 SE: 342-345	Explain the value and potential applications of genome projects.
Content Statement: Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	
5.3.12.D.2 Lesson #4 SE: 345-349	Predict the potential impact on an organism (no impact, significant impact) given a change in a specific DNA code, and provide specific real world examples of conditions caused by mutations.

Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #4 SE: 349	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).

Essential Questions:

- What experiments led to the discovery of DNA and its structure?
- How is DNA replicated?
- What is the "central dogma" of biology?
- How is gene expression regulated, and how can mutations affect this expression?

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 13 Genetics and Biotechnology**

Chapter Question: **How does genetic technology improve human health and quality of life?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 359 Lesson #1 SE: 361 Lesson #2 SE: 365	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 359 Lesson #1 SE: 361 Lesson #2 SE: 365 Chapter end 381	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 361 Chapter end 381	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 376 Chapter end 381	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 359 Lesson #2 SE: 365	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter opener 359 Lesson #1 SE: 361 Lesson #3 SE: 376 Chapter end 381	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.

Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 361 Chapter end 381	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter opener 359 Lesson #1 SE: 361 Lesson #2 SE: 365	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter opener 359 Lesson #1 SE: 361 Lesson #2 SE: 365	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #1 SE: 361	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Lesson #2 SE: 365	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter end 380, 381	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter end 381	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Genes are segments of DNA molecules located in the chromosome of each cell. DNA molecules contain information that determines a sequence of amino acids, which result in specific proteins.	
5.3.12.D.1 Lesson #2 SE: 363, 370-371 Lesson #3 SE: 372-379 Chapter end 380, 381	Explain the value and potential applications of genome projects.
Content Statement: Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	
5.3.12.D.2 Lesson #2 SE: 363, 370-371	Predict the potential impact on an organism (no impact, significant impact) given a change in a specific DNA code, and provide specific real world examples of conditions caused by mutations.
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Chapter opener 359 Lesson #1 SE: 360-362	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).
Essential Questions: • What is selective breeding? • How can genetic engineering be used to manipulate DNA? • How can genome projects enhance human health and quality of life?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 14 The History of Life**

Chapter Question: **How can fossils provide information on the origin and history of life on Earth?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 396	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 396	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter opener 391 Lesson #1 SE: 396 Chapter end 409	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 396 Chapter end 409	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 396 Chapter end 409	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 396 Chapter end 409	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #1 SE: 396 Lesson #2 SE: 406 Chapter end 409	Reflect on and revise understandings as new evidence emerges.

Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #2 SE: 406 Chapter end 409	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #1 SE: 396 Lesson #2 SE: 406 Chapter end 409	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Lesson #1 SE: 396 Chapter end 408	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 396	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter end 409	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 394, 395-396 Lesson #2 SE: 402-403	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #1 SE: 399	Predict what would happen to an ecosystem if an energy source was removed.
Content Statement: Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	
5.3.12.B.4 Lesson #2 SE: 406	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Lesson #2 SE: 405-407	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Chapter end 408	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).

<table>
<tr><td colspan="2">Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.</td></tr>
<tr><td>5.3.12.E.3
Chapter opener 391
Lesson #1
SE: 392-400
Lesson #2
SE: 402-407
Chapter end 408, 409</td><td>Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).</td></tr>
<tr><td colspan="2">Content Statement: Evolution occurs as a result of a combination of the following factors:
Ability of a species to reproduce
Genetic variability of offspring due to mutation and recombination of genes
Finite supply of the resources required for life
Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring</td></tr>
<tr><td>5.3.12.E.4
Lesson #2
SE: 405-407
Chapter end 408</td><td>Account for the evolution of a species by citing specific evidence of biological mechanisms.</td></tr>
<tr><td colspan="2">Essential Questions:
How can fossils and the geological time scale help us understand the history of life on Earth?
What does the evidence say about how life may have arisen on Earth?</td></tr>
</table>

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 15 Evolution

Chapter Question: How do natural selection and evolution help to explain the diversity of life on Earth?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 417 Lesson #1 SE: 420 Lesson #3 SE: 435 Chapter end SE: 443	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 417 Lesson #1 SE: 420 Lesson #3 SE: 435 Chapter end 443	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #2 SE: 429 Chapter end 443	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 420 Lesson #2 SE: 429 Lesson #3 SE: 435 Chapter end SE: 443	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 429 Chapter end SE: 443	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.

Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 420 Lesson #2 SE: 429 Lesson #3 SE: 435 Chapter end SE: 443	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #2 SE: 429 Chapter end 443	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #3 SE: 435 Chapter end 443	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #3 SE: 435 Chapter end 443	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #3 SE: 435 Chapter end 443	Consider alternative theories to interpret and evaluate evidence-based arguments.

Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 443	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #2 SE: 429	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #2 SE: 429	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Lesson #3 SE: 433-436 Chapter end 443	Account for the appearance of a novel trait that arose in a given population.
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #2 SE: 423-427 Chapter end 442	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).

Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 418-422 Lesson #3 SE: 431-441 Chapter end 442	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).
Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Chapter opener 417 Lesson #1 SE: 420-422 Lesson #3 SE: 431-441 Chapter end 443	Account for the evolution of a species by citing specific evidence of biological mechanisms.
Essential Questions: • What evidence did Darwin use in developing his theory of evolution through natural selection? • What evidence is available to support the theory of evolution? • What are the mechanisms of evolution and speciation?	

Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 16 Primate Evolution
Chapter Question: How did humans evolve?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #2 SE: 464 Lesson #3 SE: 468 Chapter end 475	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #2 SE: 464 Lesson #3 SE: 468 Chapter end 475	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 475	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 464 Lesson #3 SE: 468	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 464 Lesson #2 SE: 464 Lesson #3 SE: 468	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 475	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 475	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 475	Use data representations and new models to revise predictions and explanations.

Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #3 SE: 468, 471-472 Chapter end 475	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 451 Lesson #2 SE: 464 Chapter end 475	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 451 Lesson #2 SE: 464 Lesson #3 SE: 468 Chapter end 475	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #2 SE: 464	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Lesson #1 SE: 459 Lesson #2 SE: 464	Account for the appearance of a novel trait that arose in a given population.
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Chapter opener 451 Lesson #1 SE: 452-460 Lesson #2 SE: 461-466 Lesson #3 SE: 467-472 Chapter end 474	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 458-460 Lesson #2 SE: 461, 463, 465-466 Lesson #3 SE: 467-472 Chapter end 474	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).

Content Statement: Evolution occurs as a result of a combination of the following factors:

- Ability of a species to reproduce
- Genetic variability of offspring due to mutation and recombination of genes
- Finite supply of the resources required for life
- Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring

5.3.12.E.4 Lesson #1 SE: 458, 459, 460 Lesson #2 SE: 464 Lesson #3 SE: 467	Account for the evolution of a species by citing specific evidence of biological mechanisms.

Essential Questions:

- What characteristics do all primates share?
- How did hominoids evolve into hominims?
- What is the evolutionary path of early *Homo* species to humans

Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 17 Organizing Life's Diversity
Chapter Question: How is evolution related to classification?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 488 Lesson #2 SE: 494 Chapter end 505	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 488 Lesson #2 SE: 494 Chapter end 505	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 488	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 483 Lesson #1 SE: 488 Chapter end 505	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter opener 483 Lesson #1 SE: 488 Chapter end 505	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter opener 483 Lesson #1 SE: 488 Chapter end 505	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter opener 483 Lesson #1 SE: 488 Chapter end 505	Reflect on and revise understandings as new evidence emerges.

Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter opener 483 Lesson #1 SE: 488 Chapter end 505	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter opener 483 Lesson #1 SE: 488 Lesson #2 SE: 494 Chapter end 505	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 483 Chapter end 505	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 488 Lesson #3 SE: 500 Chapter end 505	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #3 SE: 500	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Lesson #2 SE: 495	Account for the appearance of a novel trait that arose in a given population.
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #2 SE: 492-496, 498 Chapter end 505	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #2 SE: 492-498	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).
Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Lesson #2 SE: 495	Account for the evolution of a species by citing specific evidence of biological mechanisms.
Essential Questions: • What were some early classification systems, and why do scientists use classification to organize the diversity of living things? • How do scientists determine species and classification today? • How is the six-kingdom, three-domain system used to classify the diversity of life?	

Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 18 Bacteria and Viruses
Chapter Question: What are bacteria and viruses?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 519 Lesson #2 SE: 528	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 519 Chapter end 533	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 519 Chapter end 533	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 519 Chapter end 533	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter opener 515 Lesson #2 SE: 529 Chapter end 533	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 519 Chapter end 533	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #2 SE: 528 Chapter end 533	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #2 SE: 528 Chapter end 533	Use data representations and new models to revise predictions and explanations.

Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #2 SE: 528 Chapter end 533	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 532, 533	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 515 Lesson #1 SE: 519 Chapter end 533	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 515 Lesson #1 SE: 519 Chapter end 533	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #1 SE: 521, 522 Lesson #2 SE: 527-529 Chapter end 533	Predict a cell's response in a given set of environmental conditions.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #1 SE: 520	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #1 SE: 524 Lesson #2 SE: 525, 527-531 Chapter end 533	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 517, 520-521, 522-523	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.

Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #1 SE: 521	Predict what would happen to an ecosystem if an energy source was removed.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Lesson #1 SE: 521	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 522-523	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #1 SE: 521 Chapter end 533	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Essential Questions: • What are bacteria? • What are viruses?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 19 Protists

Chapter Question: What are protists, and how are they related to one another?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 541 Chapter end 567	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 541 Lesson #3 SE: 558 Chapter end 567	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter opener 541 Lesson #3 SE: 558 Chapter end 567	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 558 Chapter end 567	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 541 Lesson #3 SE: 558 Chapter end 567	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter opener 541 Lesson #3 SE: 558 Chapter end 567	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #3 SE: 558 Chapter end 567	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.

Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 567	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 567	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 567	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 567	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 541 Lesson #3 SE: 558 Chapter end 567	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 541 Lesson #3 SE: 558 Chapter end 567	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #2 SE: 547, 550	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #2 SE: 549 Lesson #4 SE: 562, 563 Chapter end 567	Predict a cell's response in a given set of environmental conditions.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #2 SE: 549, 550, 551 Lesson #3 SE: 554	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Content Statement: Cell differentiation is regulated through the expression of different genes during the development of complex multicellular organisms.	
5.3.12.A.5 Chapter end 566	Describe modern applications of the regulation of cell differentiation and analyze the benefits and risks (e.g., stem cells, sex determination).
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #2 SE: 551, 552 Lesson #3 SE: 556	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).

Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 543 Lesson #2 SE: 547, 550, 551 Lesson #3 SE: 553, 555, 556, 557 Lesson #4 SE: 561	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #1 SE: 543 Lesson #3 SE: 553	Predict what would happen to an ecosystem if an energy source was removed.
Content Statement: Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	
5.3.12.B.4 Lesson #1 SE: 543 Lesson #3 SE: 553	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Lesson #1 SE: 543	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.

Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Lesson #2 SE: 549 Lesson #3 SE: 554, 560 Lesson #4 SE: 562, 563	Account for the appearance of a novel trait that arose in a given population.
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #1 SE: 545	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 545	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).
Essential Questions: • What are the characteristics of protists, and how are they subdivided into different groups? • What are protozoans? • What are algae? • What are the fungus-like protists?	

Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 20 Fungi
Chapter Question: What four phyla comprise the Kingdom Fungi?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 593	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 593	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter opener 577 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 583	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 593	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 593	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 593	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.

Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 593	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 593	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 593	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 593	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 592, 593	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #2 SE: 583 Chapter end 593	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 580 Lesson #2 SE: 583 Chapter end 593	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #1 SE: 578 Lesson #2 SE: 583	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #1 SE: 580	Predict a cell's response in a given set of environmental conditions.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #1 SE: 580 Lesson #2 SE: 583, 584	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #3 SE: 591	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).

Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 579 Lesson #2 SE: 583	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Lesson #1 SE: 580 Lesson #2 SE: 583-584, 585, 586	Account for the appearance of a novel trait that arose in a given population.
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #2 SE: 583	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Lesson #2 SE: 583-584	Account for the evolution of a species by citing specific evidence of biological mechanisms.
Essential Questions: • What are the characteristics and features of all fungi? • What are the characteristics of each of the four phyla of fungi?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 21 Introduction to Plants

Chapter Question: How did plants evolve into a diverse group of organisms?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #2 SE: 611	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #2 SE: 611	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #2 SE: 611	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.

Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #2 SE: 611	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 611 Lesson #4 SE: 620 Chapter end 623	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #2 SE: 611 Lesson #3 SE: 615 Lesson #4 SE: 620 Chapter end 623	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #2 SE: 611 Chapter end 623	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #4 SE: 620 Chapter end 623	Reflect on and revise understandings as new evidence emerges.

Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #4 SE: 620 Chapter end 623	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #4 SE: 620 Chapter end 623	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 603 Lesson #4 SE: 620 Chapter end 623	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #4 SE: 620 Chapter end 623	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 605	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 606	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #2 SE: 611	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.

Essential Questions:

- What are plants, and how did the transition to land environments affect plant evolution and diversity?
- What are the characteristics of nonvascular plants, and how are they classified?
- What are the characteristics of seedless vascular plants, and how are they classified?
- What are the characteristics of vascular seed plants, and how are they classified?

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 22 Plant Structure and Function

Chapter Question: What structures do plants have?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter end 653	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #3 SE: 650 Chapter end 653	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #3 SE: 650 Chapter end 653	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.

Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #2 SE: 646 Lesson #3 SE: 650 Chapter end SE: 653	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 646 Lesson #3 SE: 650 Chapter end SE: 653	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #3 SE: 650 Chapter end SE: 653	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #3 SE: 650 Chapter end SE: 653	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.

Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #3 SE: 650 Chapter end SE: 653	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #3 SE: 650 Chapter end SE: 653	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #3 SE: 650 Chapter end SE: 653	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end SE: 653	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter end SE: 653	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 634 Chapter end SE: 653	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #2 SE: 644-645 Chapter end 652	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	
5.3.12.B.4 Lesson #2 SE: 644-645	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Chapter end 652	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #3 SE: 649 Chapter end 653	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Essential Questions: • What are the various types of plant cells and tissues? • How is the structure of roots, stems, and leaves related to their function? • How do hormones affect a plant's response to its environment?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 23 Reproduction in Plants**

Chapter Question: **What are the life cycles of the various plant divisions?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter end 681 Lesson #2 SE: 672	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter end 681 Lesson #2 SE: 672	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 681 Lesson #2 SE: 672	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 678 Chapter end 681	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #3 SE: 678 Chapter end 681	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #3 SE: 678 Chapter end 681	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 681	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 681	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 681	Use data representations and new models to revise predictions and explanations.

Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 681	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 680, 681	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 661 Lesson #2 SE: 672 Chapter end 681	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter end 681	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #2 SE: 670, 671 Lesson #3 SE: 678	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.

Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #1 SE: 662-663 Chapter end 680	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Genes are segments of DNA molecules located in the chromosome of each cell. DNA molecules contain information that determines a sequence of amino acids, which result in specific proteins.	
5.3.12.D.1 Chapter end 680	Explain the value and potential applications of genome projects.
Content Statement: Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	
5.3.12.D.2 Chapter end 680	Predict the potential impact on an organism (no impact, significant impact) given a change in a specific DNA code, and provide specific real world examples of conditions caused by mutations.
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 663-667 Lesson #3 SE: 675-676	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).
Essential Questions: • What is the role of "alternation of generation" in the life cycles of mosses, ferns, and conifers? • What are flowers, and what accounts for the great diversity in their structure? • What is the life cycle of flowering plants?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 24 Introduction to Animals**

Chapter Question: **How are body plans and adaptations used to classify animals?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter end 717	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter end 717	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 717	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.

Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 693 Chapter end 717	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 693 Chapter end 717	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 693 Chapter end 717	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 693 Chapter end 717	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 717	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 717	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 717	Consider alternative theories to interpret and evaluate evidence-based arguments.

Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #2 SE: 702 Chapter end 717	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 693 Lesson #2 SE: 702 Chapter end 717	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #1 SE: 695-697 Lesson #2 SE: 699-703 Lesson #3 SE: 708	Distinguish between the processes of cellular growth (cell division) and development (differentiation).

Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 692, 693 Lesson #3 SE: 706, 710	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 692 Lesson #3 Se: 713, 714	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #3 SE: 714	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 695, 708, 712	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).

Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #2 SE: 698-704 Lesson #3 SE: 705 Lesson #4 SE: 715	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 692 Lesson #2 SE: 698-704 Lesson #3 SE: 705 Lesson #4 SE: 715	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).
Essential Questions: • What is an animal? • How are animal body plans used to determine animal phylogeny? • What are the characteristics of sponges and cnidarians?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 25 Worms and Mollusks

Chapter Question: How are earthworms and mollusks adapted to live as parasites or in water or soil?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 728 Lesson #2 SE: 732 Lesson #3 SE: 743	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 728 Lesson #2 SE: 732	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 728 Chapter end 753	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 728 Lesson #3 SE: 743 Chapter end 753	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 728 Lesson #3 SE: 743 Chapter end 753	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 728 Lesson #3 SE: 743 Chapter end 753	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.

Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 728 Lesson #3 SE: 743 Chapter end 753	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #1 SE: 728	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 728 Lesson #4 SE: 748	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 728 Chapter end 753	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #1 SE: 727	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #1 SE: 729	Predict a cell's response in a given set of environmental conditions.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #1 SE: 728 Lesson #4 SE: 748	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Content Statement: Cell differentiation is regulated through the expression of different genes during the development of complex multicellular organisms.	
5.3.12.A.5 Chapter end 752	Describe modern applications of the regulation of cell differentiation and analyze the benefits and risks (e.g., stem cells, sex determination).
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #1 SE: 729 Lesson #2 SE: 733, 734, 735	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).

Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 727 Lesson #2 SE: 732 Lesson #3 SE: 738, 744 Lesson #4 SE: 746, 750	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 726, 727, 729 Lesson #2 SE: 732, 733, 734-735 Lesson #3 SE: 744 Lesson #4 SE: 750	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #3 SE: 744 Lesson #4 SE: 750	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.

Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Genes are segments of DNA molecules located in the chromosome of each cell. DNA molecules contain information that determines a sequence of amino acids, which result in specific proteins.	
5.3.12.D.1 Lesson #2 SE: 733 Chapter end 752	Explain the value and potential applications of genome projects.
Content Statement: Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	
5.3.12.D.2 Chapter end 752	Predict the potential impact on an organism (no impact, significant impact) given a change in a specific DNA code, and provide specific real world examples of conditions caused by mutations.
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 728 Lesson #2 SE: 733 Lesson #3 SE: 741 Lesson #4 SE: 748	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Chapter end 752	Account for the appearance of a novel trait that arose in a given population.

Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #1 SE: 726 Lesson #2 SE: 731 Lesson #3 SE: 737 Lesson #4 SE: 745, 751	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 726 Lesson #2 SE: 731 Lesson #3 SE: 737 Lesson #4 SE: 745, 751	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).
Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Lesson #3 SE: 737 Chapter end 752	Account for the evolution of a species by citing specific evidence of biological mechanisms.
Essential Questions: • What are flatworms? • What are roundworms and rotifers? • What are mollusks?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 26 Arthropods

Chapter Question: What arthropod adaptations have led to their successful diversity, populations, and persistence?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #3 SE: 777 Chapter end 783	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter end 783	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 783	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.

Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 777 Chapter end 783	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 773 Lesson #3 SE: 777 Chapter end 783	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #2 SE: 773 Lesson #3 SE: 777	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #2 SE: 773 Chapter end 783	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #3 SE: 777	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #3 SE: 777	Use data representations and new models to revise predictions and explanations.

Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #3 SE: 777	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 783	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 761 Lesson #1 SE: 765 Lesson #2 SE: 773 Chapter end 783	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 761 Lesson #1 SE: 765 Lesson #3 SE: 773 Chapter end 783	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #1 SE: 765 Lesson #2 SE: 772	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #3 SE: 778	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 765 Lesson #2 SE: 772, 773 Lesson #3 SE: 776	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #3 SE: 780	Predict what would happen to an ecosystem if an energy source was removed.

Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #3 SE: 780 Chapter end 783	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #3 SE: 780	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 769	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #1 SE: 762 Lesson #3 SE: 781	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 762 Lesson #3 SE: 781	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).

Content Statement: Evolution occurs as a result of a combination of the following factors:

- Ability of a species to reproduce
- Genetic variability of offspring due to mutation and recombination of genes
- Finite supply of the resources required for life
- Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring

5.3.12.E.4 Lesson #1 SE: 762 Lesson #3 SE: 776	Account for the evolution of a species by citing specific evidence of biological mechanisms.

Essential Questions:

- What are the characteristics of arthropods?
- What are the different groups of arthropods?
- What insect adaptations have led to their evolutionary success?

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 27 Echinoderms and Invertebrate Chordates

Chapter Question: What features of echinoderms and invertebrate chordates connect them to chordates that evolved after them?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 793 Lesson #2 SE: 806	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 793 Lesson #2 SE: 806	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 793 Lesson #2 SE: 806	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 793	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 793	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 793	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 793	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 809	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 809	Use data representations and new models to revise predictions and explanations.

Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 809	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 809	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 793 Chapter end 808, 809	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 791 Lesson #1 SE: 793	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #1 SE: 795	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #1 SE: 796, 798	Distinguish between the processes of cellular growth (cell division) and development (differentiation).

Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Chapter end 808	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 793, 795	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #1 SE: 801	Predict what would happen to an ecosystem if an energy source was removed.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 801	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #1 SE: 801	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 796	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).

Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #1 SE: 792, 796 Lesson #2 SE: 802-804, 806-807	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 792, 796 Lesson #2 SE: 802-804, 806-807	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).
Essential Questions: • What are echinoderms? • What features of invertebrate chordates link them to vertebrate chordates?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 28 Fishes and Amphibians

Chapter Question: What adaptations enable fish to thrive in aquatic environment and amphibians to live part of their lives on land?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter end 843	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter end 843	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 843	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.

Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #2 SE: 830 Lesson #3 SE: 837 Chapter end 843	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter end 843	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter end 843	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 843	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 819 Chapter end 843	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter end 843	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #1 SE: 825 Lesson #3 SE: 835	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #1 SE: 821 Lesson #3 SE: 838	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 825 Lesson #2 SE: 883 Lesson #3 SE: 835	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.

Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 825 Lesson #2 SE: 833 Lesson #3 SE: 841	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #2 SE: 833 Lesson #3 SE: 841 Chapter end 843	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	
5.3.12.D.2 Chapter end 842	Predict the potential impact on an organism (no impact, significant impact) given a change in a specific DNA code, and provide specific real world examples of conditions caused by mutations.
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 826 Lesson #3 SE: 838	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).

Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #1 SE: 820-821 Lesson #2 SE: 832 Lesson #3 SE: 834, 840	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 820-821 Lesson #2 SE: 832 Lesson #3 SE: 834, 840	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).
Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Lesson #1 SE: 826 Lesson #2 SE: 832 Lesson #3 SE: 834-835 Lesson #4 SE: 840	Account for the evolution of a species by citing specific evidence of biological mechanisms.

Essential Questions:

- What characteristics of fishes enable them to survive and reproduce in aquatic environments?
- What are the three classes of fishes?
- What characteristics of amphibians enable them to live part of their life in water and part of their life on land?

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 29 Reptiles and Birds

Chapter Question: What adaptations in reptiles and birds enable them to live and reproduce on land?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 859	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #2 SE: 866	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #2 SE: 866	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.

Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #2 SE: 866	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #2 SE: 866	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #2 SE: 866	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #2 SE: 866	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Lesson #2 SE: 866	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #2 SE: 866 Chapter end 871	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 854 Lesson #2 SE: 864, 865, 869	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	
5.3.12.B.3 Lesson #1 SE: 859, 860	Predict what would happen to an ecosystem if an energy source was removed.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 860 Lesson #2 SE: 869 Chapter end 870	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #1 SE: 859, 860 Lesson #2 SE: 869 Chapter end 870	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.

Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 856 Lesson #2 SE: 866	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #1 SE: 852, 858-859 Lesson #2 SE: 861, 868	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 852, 858-589 Lesson #2 SE: 861, 868	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).

Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Lesson #1 SE: 859	Account for the evolution of a species by citing specific evidence of biological mechanisms.
Essential Questions: • What characteristics of reptiles enable them to live on land? • How are birds adapted for flight and life in terrestrial environments?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 30 Mammals

Chapter Question: What adaptations have evolved in mammals that enable them to live in a variety of habitats?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter end 899	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter end 899	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 899	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.

Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Chapter end 899	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter end 899	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter end 899	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 899	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 899	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 899	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 899	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 899	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.

Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 884 Chapter end 899	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 884	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 882	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Each recombination of matter and energy results in storage and dissipation of energy into the environment as heat.	
5.3.12.B.2 Lesson #1 SE: 881, 882	Use mathematical formulas to justify the concept of an efficient diet.
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #1 SE: 882	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
Content Statement: Stability in an ecosystem can be disrupted by natural or human interactions.	
5.3.12.C.2 Lesson #2 SE: 895	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.

Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Lesson #1 SE: 887	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.	
5.3.12.E.2 Lesson #1 SE: 880 Lesson #2 SE: 896	Estimate how closely related species are, based on scientific evidence (e.g., anatomical similarities, similarities of DNA base and/or amino acid sequence).
Content Statement: The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	
5.3.12.E.3 Lesson #1 SE: 880 Lesson #2 SE: 890, 891, 896-897	Provide a scientific explanation for the history of life on Earth using scientific evidence (e.g., fossil record, DNA, protein structures, etc.).

Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Lesson #2 SE: 890, 891, 896-897	Account for the evolution of a species by citing specific evidence of biological mechanisms.
Essential Questions: • What characteristics do all mammals share? • What are the three subgroups of mammals?	

Glencoe/McGraw-Hill

***Biology* © 2009**
Chapter Title: Chapter 31 Animal Behavior
Chapter Question: What factors determine behavior?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 912 Lesson #2 SE: 918 Chapter end 925	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 912 Lesson #2 SE: 918 Chapter end 925	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 912 Chapter end 925	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 912 Chapter end 925	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 912 Chapter end 925	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 912 Chapter end 925	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 912 Chapter end 925	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 925	Reflect on and revise understandings as new evidence emerges.

Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 925	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 925	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter end 925	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 913 Chapter end 925	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	
5.3.12.C.1 Lesson #2 SE: 917-918	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.

Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: Evolution occurs as a result of a combination of the following factors: • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring	
5.3.12.E.4 Lesson #1 SE: 909 Lesson #2 SE: 921	Account for the evolution of a species by citing specific evidence of biological mechanisms.
Essential Questions: • What is the role of evolution in innate and learned behavior? • How do complex behaviors contribute to survival and reproduction?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 32 Integumentary, Skeletal, and Muscular Systems

Chapter Question: How do the integumentary, skeletal, and muscular systems work together to protect, support, and move the body?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #3 SE: 950 Chapter end 953	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #3 SE: 950 Chapter end 953	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 953	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #3 SE: 950 Chapter end 953	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter end 953	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter end 953	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 953	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Chapter end 953	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Chapter end 953	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Chapter end 953	Consider alternative theories to interpret and evaluate evidence-based arguments.

Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 935 Lesson #2 SE: 945	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 938 Lesson #2 SE: 945	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cells are made of complex molecules that consist mostly of a few elements. Each class of molecules has its own building blocks and specific functions.	
5.3.12.A.1 Lesson #2 SE: 946	Represent and explain the relationship between the structure and function of each class of complex molecules using a variety of models.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #1 SE: 938 Lesson #2 SE: 943 Chapter end 952	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Content Statement: Cell differentiation is regulated through the expression of different genes during the development of complex multicellular organisms.	
5.3.12.A.5 Chapter end 952	Describe modern applications of the regulation of cell differentiation and analyze the benefits and risks (e.g., stem cells, sex determination).

Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #1 SE: 939-940	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #3 SE: 950	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	
5.3.12.B.5 Lesson #3 SE: 950	Investigate and describe the complementary relationship (cycling of matter and flow of energy) between photosynthesis and cellular respiration.
Content Statement: All organisms must break the high-energy chemical bonds in food molecules during cellular respiration to obtain the energy needed for life processes.	
5.3.12.B.6 Lesson #3 SE: 950	Explain how the process of cellular respiration is similar to the burning of fossil fuels.
Essential Questions: • What is the structure and function of the skin? • What is the structure and function of the skeletal system? • How do the three types of muscle differ in structure and function?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 33 Nervous System

Chapter Question: How does the nervous system enable communication among cells, tissues, and organs?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 961 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 961 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.

Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #3 SE: 975	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #3 SE: 975	Use data representations and new models to revise predictions and explanations.
Content Statement: Science is a practice in which an established body of knowledge is continually revised, refined, and extended as new evidence emerges.	
5.1.12.C.3 Lesson #3 SE: 975	Consider alternative theories to interpret and evaluate evidence-based arguments.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 961 Chapter end 983	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.

Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #3 SE: 975 Chapter end 983	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 965 Lesson #3 SE: 975 Chapter end 983	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #2 SE: 970 Lesson #4 SE: 981	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Essential Questions: • What are neurons and how do they conduct electrical impulses to cells, tissues, and organs? • What are the two major divisions of the nervous system, and what is the function of each? • How do the senses enable you to detect the world around you? • How do drugs affect the nervous system?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 34 Circulatory, Respiratory, and Excretory Systems

Chapter Question: How do the circulatory, respiratory, and excretory systems function together to maintain homeostasis?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 991 Lesson #1 SE: 996 Lesson #2 SE: 1002	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.

Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 991 Lesson #1 SE: 996 Lesson #2 SE: 1002	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Lesson #1 SE: 996 Lesson #2 SE: 1002	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #1 SE: 996 Lesson #2 SE: 1002	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 996 Lesson #2 SE: 1002	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 996 Lesson #2 SE: 1002	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.

Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Lesson #1 SE: 996 Lesson #2 SE: 1002	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: C. Reflect on Scientific Knowledge: Scientific knowledge builds on itself over time.	
Content Statement: Refinement of understandings, explanations, and models occurs as new evidence is incorporated.	
5.1.12.C.1 Lesson #2 SE: 1002	Reflect on and revise understandings as new evidence emerges.
Content Statement: Data and refined models are used to revise predictions and explanations.	
5.1.12.C.2 Lesson #2 SE: 1002	Use data representations and new models to revise predictions and explanations.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Lesson #1 SE: 996 Lesson #2 SE: 1002 Chapter end 1010	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #2 SE: 1002 Chapter end 1010	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #1 SE: 996 Lesson #2 SE: 1002	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #1 SE: 999 Lesson #2 SE: 1004 Lesson #3 SE: 1008-1009	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).
Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #2 SE: 1000	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Each recombination of matter and energy results in storage and dissipation of energy into the environment as heat.	
5.3.12.B.2 Lesson #2 SE: 1002 Chapter end 1011	Use mathematical formulas to justify the concept of an efficient diet.
Content Statement: All organisms must break the high-energy chemical bonds in food molecules during cellular respiration to obtain the energy needed for life processes.	
5.3.12.B.6 Lesson #2 SE: 1000	Explain how the process of cellular respiration is similar to the burning of fossil fuels.

Essential Questions:

- How does the structure of the circulatory system facilitate the delivery of oxygen to and removal of waste from cells?
- How does the structure of the respiratory system facilitate the exchange of oxygen and carbon dioxide between the atmosphere and the blood and between the blood the body's cells?
- How does the excretory system maintain homeostatis by removing wastes and water from the body?

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: Chapter 35 Digestive and Endocrine Systems

Chapter Question: How does the digestive system break down food to provide energy and nutrients to the body, and how do hormones regulate body functions?

Chapter Overview Template	
Content Area: Science	
Target Course/Grade Level: Science Grades 9-12	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: 5.1 Science Practices: All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.

Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Lesson #1 SE: 1023 Lesson #3 SE: 1035 Chapter end 1039	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 1019 Lesson #1 SE: 1023 Chapter end 1039	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cells are made of complex molecules that consist mostly of a few elements. Each class of molecules has its own building blocks and specific functions.	
5.3.12.A.1 Lesson #2 SE: 1026-1027	Represent and explain the relationship between the structure and function of each class of complex molecules using a variety of models.
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Chapter opener 1019 Lesson #1 SE: 1020, 1021, 1022, 1023 Chapter end 1039	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.

Strand: B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	
Content Statement: As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	
5.3.12.B.1 Lesson #1 SE: 1020-1024 Lesson #2 SE: 1025-1027	Cite evidence that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.
Content Statement: Each recombination of matter and energy results in storage and dissipation of energy into the environment as heat.	
5.3.12.B.2 Lesson #2 SE: 1025	Use mathematical formulas to justify the concept of an efficient diet.
Essential Questions: • What is the role of each part of the digestive system in breaking down food for energy and nutrients? • What is the role of nutrients in the body? • How do hormones regulate the body's systems?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 36 Human Reproduction and Development**

Chapter Question: How do humans reproduce and develop?

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Lesson #1 SE: 1052	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Lesson #1 SE: 1052	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
Strand: **D. Participate Productively in Science:** The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter end 1066	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.

Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter end 1047 Lesson #2 SE: 1060 Chapter end SE: 1067	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.
Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Chapter opener 1047	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	
5.3.12.A.2 Lesson #2 SE: 1054	Demonstrate the properties and functions of enzymes by designing and carrying out an experiment.
Content Statement: Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	
5.3.12.A.4 Lesson #2 SE: 1054-1059, 1060 Chapter end 1067	Distinguish between the processes of cellular growth (cell division) and development (differentiation).
Strand: D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
Content Statement: Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	
5.3.12.D.2 Chapter end 1066	Predict the potential impact on an organism (no impact, significant impact) given a change in a specific DNA code, and provide specific real world examples of conditions caused by mutations.

Content Statement: Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	
5.3.12.D.3 Chapter opener 1047 Lesson #1 SE: 1051, 1052 Lesson #2 SE: 1054-1055	Demonstrate through modeling how the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization).
Strand: E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
Content Statement: New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	
5.3.12.E.1 Chapter end 1066	Account for the appearance of a novel trait that arose in a given population.
Essential Questions: • How do hormones control the production of gametes in the male and female reproductive systems? • What is the path of development from a fertilized egg into trillions of cells with specific functions? • What are the stages of development in the human life span?	

Glencoe/McGraw-Hill

***Biology* © 2009**

Chapter Title: **Chapter 37 The Immune System**

Chapter Question: **How does the immune system protect the body from pathogens?**

Chapter Overview Template	
Content Area: **Science**	
Target Course/Grade Level: **Science Grades 9-12**	
21st Century Themes **Global Awareness** **21st Century Skills** **Creativity and Innovation – Critical Thinking and Problem Solving – Communication and Collaboration – Information Literacy Media Literacy – ICTY Literacy – Life and Career skills**	
Learning Targets	
Standard: **5.1 Science Practices:** All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.	
Strand: **A. Understand Scientific Explanations**: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.	
5.1.12.A.1 Chapter opener 1075 Lesson #1 SE: 1082 Chapter end 1097	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
Content Statement: Interpretation and manipulation of evidence-based models are used to build and critique arguments/explanations.	
5.1.12.A.2 Chapter opener 1075 Lesson #2 SE: 1082 Chapter end 1097	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

Content Statement: Revisions of predictions and explanations are based on systematic observations, accurate measurements, and structured data/evidence.	
5.1.12.A.3 Chapter end 1097	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
Strand: B. Generate Scientific Evidence Through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.	
Content Statement: Logically designed investigations are needed in order to generate the evidence required to build and refine models and explanations.	
5.1.12.B.1 Lesson #2 SE: 1090	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
Content Statement: Mathematical tools and technology are used to gather, analyze, and communicate results.	
5.1.12.B.2 Lesson #1 SE: 1082	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
Content Statement: Empirical evidence is used to construct and defend arguments.	
5.1.12.B.3 Lesson #1 SE: 1082	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
Content Statement: Scientific reasoning is used to evaluate and interpret data patterns and scientific conclusions.	
5.1.12.B.4 Chapter end 1097	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.
Strand: D. Participate Productively in Science: The growth of scientific knowledge involves critique and communication, which aresocial practices that are governed by a core set of values and norms.	
Content Statement: Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.	
5.1.12.D.1 Chapter opener 1075 Chapter end 1096, 1097	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
Content Statement: Science involves using language, both oral and written, as a tool for making thinking public.	
5.1.12.D.2 Chapter opener 1075 Chapter end 1097	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

Content Statement: Ensure that instruments and specimens are properly cared for and that animals, when used, are treated humanely, responsibly, and ethically.	
5.1.12.D.3 Lesson #3 SE: 1093	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
Standard: 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.	
Strand: A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
CPI #	**Cumulative Progress Indicator (CPI)**
Content Statement: Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.	
5.3.12.A.3 Lesson #2 SE: 1084-1089	Predict a cell's response in a given set of environmental conditions.
Content Statement: There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	
5.3.12.A.6 Lesson #1 SE: 1076, 1080-1083 Lesson #2 SE: 1090-1091 Lesson #3 SE: 1092-1095 Chapter end 1096	Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions (e.g., diabetes, cystic fibrosis, lactose intolerance).

Essential Questions:

- What are pathogens, and how are they dispersed?
- What are the two main components of the immune system, and how do they protect the body against pathogens?
- What are some of the types of noninfectious disorders that can affect the body?