GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 1: NATURE OF SCIENCE

Big Questions	Formative/ Summative Assessments Formative and summative assessments created by teachers/teams
1. What challenges have scientists encountered as they presented their work? 2. How do scientists design a controlled experiment? 3. How do scientists use evidence to support conclusions? 4. How do scientists use tools to get data and keep themselves safe?	Options include, but are not limited to: • Nature of Science Paper/Pencil Test • Lifesaver Lab • Formative Assessment: Check for Understanding Observation vs. Inference • Nature Journals

Substrand/Standard	Curriculum Benchmark	MCA III Test Item Specifications	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Substrand: The Practice of Science Standard: Understand that science is a way of knowing about the natural world and is characterized by empirical criteria, logical argument and skeptical review.	**Understand that prior expectations can create bias when conducting scientific investigations. (**For Example: Students often continue to think that air is not matter, even though they have contrary evidence from investigations.) (7.1.1.1.1)	• Items may address common preconceptions of middle level students. • Items assessing this benchmark may also assess benchmark 7.1.1.2.4.		
Substrand: The Practice of Science Standard: Understand that science is a way of knowing about the natural world and is characterized by empirical criteria, logical argument and skeptical review.	**Understand that when similar investigations give different results, the challenge is to judge whether the differences are significant, and if further studies are required.** (For Example: Use mean and range to analyze the reliability of experimental results.) (7.1.1.1.2)	• Items may require students to compare statistical data from different investigations. • Items will NOT require students to make statistical calculations. • Statistics provided will be limited to mean, median and range. • Items may include qualitative or quantitative data. • Items may include graphs and tables to represent investigation results. • Items will NOT include the terms reliability and validity.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 1: NATURE OF SCIENCE (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.** (7.1.1.2.1)	• Items may require students to determine if a given question is investigable in the context of science content. • Items may require students to determine if a given question is appropriate for specific methods of investigations. • Examples of controlled experiments may include testing motion using time, speed, mass and location as variables. • Examples of field studies may include sampling populations of living organisms. • Examples of review of existing work may include internet review of climate change. • Examples of development of models may include planetary models.		Nature All Year Long, by Claire Walker Leslie
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).** (For Example: The effect of various factors on the production of carbon dioxide by plants.) (7.1.1.2.2)	• Context for items may be from physical science, life science or Earth science areas. • Items may require students to identify a hypothesis, determine materials needed for the experiment or describe a procedure. • Items will NOT require students to identify a specific order of steps in an investigation. • Items may ask students to identify which variables are changed by the investigator, which are kept the same (controlled) and which are measured or observed. • Items will NOT use the terms independent variable, dependent variable, manipulated variable or responding variables. • Information used to specify variables must be provided.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 1: NATURE OF SCIENCE (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).** (7.1.1.2.3)	• Items may require students to draw conclusions based on evidence. • Results (evidence) consist of observations and data on which to base scientific explanations. • Conclusions (explanations) are based on evidence from a single or a few related experiments that could be performed in a classroom setting. • Items assessing this benchmark may also assess benchmarks 8.1.1.1.1, 7.1.3.4.1 and 8.1.3.4.1.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Evaluate explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, and suggesting alternative explanations.** (7.1.1.2.4)	• Items may require students to evaluate whether the evidence supports the conclusion when evaluating explanations. • Items will NOT require students to evaluate the source of the evidence. • Items assessing this benchmark may also assess benchmark 7.1.1.1.1.		
Substrand: Interactions Among Science, Technology, Engineering, Mathematics and Society Standard: Understand that current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.	Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a life science context. (7.1.3.4.2)	• Examples of tools include a Celsius thermometer, metric ruler, timer, electronic balance, microscope, hand lens and graduated cylinder. • Items may require students to determine the tool used to accurately measure a particular quantity. • Items may include constructing and analyzing graphs from a set of data and comparing graphs and data. • Mathematical analyses are limited to mean, median and range.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: ECOLOGY

Big Questions	Formative/Summative Assessments Formative and summative assessments created by teachers/teams
• How do scientists design a controlled experiment? • How do scientists use evidence to support conclusions? • How do scientists use evidence to get data and keep themselves safe? • How do scientists look for patterns in longitudinal data? • How do humans affect wildlife populations in a positive and negative way? • What are four parts of an ecosystem and how do they interact? • How does energy flow through an ecosystem? • How is matter recycled in an ecosystem?	Options include, but are not limited to: • Buckthorn Longitudinal Field Study • Ecology Paper/Pencil Test • Diversity Lab • Formative Assessment: Exclusive Brainstorming on Parts of Ecosystem

Substrand/Standard	Curriculum Benchmark	MCA III Test Item Specifications	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.** (7.1.1.2.1)	• Items may require students to determine if a given question is investigable in the context of science content. • Items may require students to determine if a given question is appropriate for specific methods of investigations. • Examples of controlled experiments may include testing motion using time, speed, mass and location as variables. • Examples of field studies may include sampling populations of living organisms. • Examples of review of existing work may include internet review of climate change. • Examples of development of models may include planetary models.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: ECOLOGY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).** (For Example: The effect of various factors on the production of carbon dioxide by plants.) (7.1.1.2.2)	• Context for items may be from physical science, life science or Earth science areas. • Items may require students to identify a hypothesis, determine materials needed for the experiment or describe a procedure. • Items will NOT require students to identify a specific order of steps in an investigation. • Items may ask students to identify which variables are changed by the investigator, which are kept the same (controlled) and which are measured or observed. • Items will NOT use the terms independent variable, dependent variable, manipulated variable or responding variables. • Information used to specify variables must be provided.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).** (7.1.1.2.3)	• Items may require students to draw conclusions based on evidence. • Results (evidence) consist of observations and data on which to base scientific explanations. • Conclusions (explanations) are based on evidence from a single or a few related experiments that could be performed in a classroom setting. • Items assessing this benchmark may also assess benchmarks 8.1.1.1.1, 7.1.3.4.1 and 8.1.3.4.1.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Evaluate explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, and suggesting alternative explanations.** (7.1.1.2.4)	• Items may require students to evaluate whether the evidence supports the conclusion when evaluating explanations. • Items will NOT require students to evaluate the source of the evidence. • Items assessing this benchmark may also assess benchmark 7.1.1.1.1.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: ECOLOGY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Interactions Among Science, Technology, Engineering, Mathematics and Society Standard: Understand that current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.	Use maps, satellite images and other data sets to describe patterns and make predictions about natural systems in a life science context. (For Example: Use online data sets to compare wildlife populations or water quality in regions of Minnesota.) (7.1.3.4.1)	• Examples may include graphs of data, predator prey data sets and maps of population distributions and Minnesota ecosystems. • Items assessing this benchmark may also assess benchmark 7.1.1.2.3.		
Substrand: Interactions Among Science, Technology, Engineering, Mathematics and Society Standard: Understand that current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.	Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a life science context. (7.1.3.4.2)	• Examples of tools include a Celsius thermometer, metric ruler, timer, electronic balance, microscope, hand lens and graduated cylinder. • Items may require students to determine the tool used to accurately measure a particular quantity. • Items may include constructing and analyzing graphs from a set of data and comparing graphs and data. • Mathematical analyses are limited to mean, median and range.		
Substrand: Interdependence Among Living Systems Standard: Understand that natural systems include a variety of organisms that interact with one another in several ways.	Identify a variety of populations and communities in an ecosystem and describe the relationships among the populations and communities in a stable ecosystem. (7.4.2.1.1)	• Items may require students to distinguish between a population and a community. • Items may require students to identify population trends based on a relationship. • Items may describe non-food related relationships such as mutualism and competition but will NOT use the terms mutualism, commensalism or symbiosis. • Populations, communities and organisms are limited to those commonly recognizable in Minnesota. • Additional vocabulary may include terms such as niche.		Pearson "Interactive Science: Grades 6-8 Ecology and the Environment" McDougal Littel "Life Science"

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: ECOLOGY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Interdependence Among Living Systems Standard: Understand that natural systems include a variety of organisms that interact with one another in several ways.	Compare and contrast predator/prey, parasite/host and producer/consumer/ decomposer relationships. (7.4.2.1.2)	• Items may require students to identify the roles in a relationship such as producers and consumers, predator and prey. • Organisms are limited to those commonly recognizable in Minnesota. • Predator-prey relationships may include owls and mice, and wolves and deer. • Parasite-host relationships may include wood ticks and humans, deer ticks and humans, deer ticks and dogs and tapeworms and dogs. • Producer-consumer-decomposer relationships may include relationships such as the relationship between grass and rabbits and relationships of deer and fungi.		Pearson "Interactive Science: Grades 6-8 Ecology and the Environment" McDougal Littel "Life Science" When the Wolves Return, by Dorothy Henshew Patent Case of the Mummified Pig, by Susan E. Quinlan
Substrand: Interdependence Among Living Systems Standard: Understand that natural systems include a variety of organisms that interact with one another in several ways.	Explain how the number of populations an ecosystem can support depends on the biotic resources available as well as abiotic factors such as amount of light and water, temperature range and soil composition. (7.4.2.1.3)	• Ecosystems are limited to Minnesota ecosystems such as forests, prairies, streams and lakes. • Items will use the terms living and non-living factors and will NOT use the terms biotic and abiotic. • Additional vocabulary may include terms such as niche, shelter and habitat.		Pearson "Interactive Science: Grades 6-8 Ecology and the Environment" McDougal Littel "Life Science"
Substrand: Interdependence Among Living Systems Standard: Understand that the flow of energy and the recycling of matter are essential to a stable ecosystem.	Describe the roles and relationships among producers, consumers and decomposers in changing energy from one form to another in a food web within an ecosystem. (7.4.2.2.2)	• Organisms in food webs are limited to those commonly recognizable in Minnesota. • If organisms are listed or labeled, broad terms such as owl, eagle, fish, snake, mouse, fox, plant, worm, frog or insect must be used. • Items will NOT assess specific percentages of energy transferred between trophic levels. • Items may require students to understand energy pyramids and that only a very small fraction of the available energy is transferred. • Items will label all organisms with the terms producer, primary consumer, secondary consumer, tertiary consumer and decomposer when illustrating a food chain or web.		Horseshoe Crabs and Shorebirds, by Victoria Crensen Backyard Detectives When the Wolves Return, by Dorothy Henshew Patent Pearson "Interactive Science: Grades 6-8 Ecology and the Environment" McDougal Littel "Life Science"

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: ECOLOGY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Interdependence Among Living Systems Standard: Understand that the flow of energy and the recycling of matter are essential to a stable ecosystem.	Explain that the total amount of matter in an ecosystem remains the same as it is transferred between organisms and their physical environment, even though its form and location change. (For Example: construct a food web to trace the flow of matter in an ecosystem.) (7.4.2.2.3)	• Organisms are limited to those commonly recognizable in Minnesota. • Ecosystems are limited to Minnesota ecosystems, such as forests, prairies, streams and lakes. • Organisms may include producers, consumers and decomposers.		Pearson "Interactive Science: Grades 6-8 Ecology and the Environment" McDougal Littel "Life Science"
Substrand: Human Interactions with Living Systems Standard: Understand that human activity can change living organisms and ecosystems.	Describe ways that human activities can change the populations and communities in an ecosystem. (7.4.4.1.2)	• Change as a result of human activities may include chemicals in the environment, bacterial resistance, pollution, deforestation, over-hunting and urban development. • Items may require students to describe the effects of human activity when given an example.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 3: CELLS

Big Questions	Formative/ Summative Assessments Formative and summative assessments created by teachers/teams
• How do scientists design a controlled experiment? • How do scientists use evidence to support conclusions? • How do scientists use evidence to get data and keep themselves safe? • How do the structure of cells and organs help them do their jobs? • How do cells grow and divide? • What are two differences between plant and animal cells?	Options include, but are not limited to: • Design and Build a 3-D Cell Model • Cell Unit Paper/Pencil Test • Egg Lab • Nature Journals

Substrand/Standard	Curriculum Benchmark	MCA III Test Item Specifications	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.** (7.1.1.2.1)	• Items may require students to determine if a given question is investigable in the context of science content. • Items may require students to determine if a given question is appropriate for specific methods of investigations. • Examples of controlled experiments may include testing motion using time, speed, mass and location as variables. • Examples of field studies may include sampling populations of living organisms. • Examples of review of existing work may include internet review of climate change. • Examples of development of models may include planetary models.		Nature All Year Long, by Claire Walker Leslie
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).** (For Example: The effect of various factors on the production of carbon dioxide by plants.) (7.1.1.2.2)	• Context for items may be from physical science, life science or Earth science areas. • Items may require students to identify a hypothesis, determine materials needed for the experiment or describe a procedure. • Items will NOT require students to identify a specific order of steps in an investigation. • Items may ask students to identify which variables are changed by the investigator, which are kept the same (controlled) and which are measured or observed. • Items will NOT use the terms independent variable, dependent variable, manipulated variable or responding variables. • Information used to specify variables must be provided.		

UNIT 3: CELLS (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).** (7.1.1.2.3)	• Items may require students to draw conclusions based on evidence. • Results (evidence) consist of observations and data on which to base scientific explanations. • Conclusions (explanations) are based on evidence from a single or a few related experiments that could be performed in a classroom setting. • Items assessing this benchmark may also assess benchmarks 8.1.1.1.1, 7.1.3.4.1 and 8.1.3.4.1.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Evaluate explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, and suggesting alternative explanations.** (7.1.1.2.4)	• Items may require students to evaluate whether the evidence supports the conclusion when evaluating explanations. • Items will NOT require students to evaluate the source of the evidence. • Items assessing this benchmark may also assess benchmark 7.1.1.1.1.		
Substrand: Interactions Among Science, Technology, Engineering, Mathematics and Society Standard: Understand that current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.	Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a life science context. (7.1.3.4.2)	• Examples of tools include a Celsius thermometer, metric ruler, timer, electronic balance, microscope, hand lens and graduated cylinder. • Items may require students to determine the tool used to accurately measure a particular quantity. • Items may include constructing and analyzing graphs from a set of data and comparing graphs and data. • Mathematical analyses are limited to mean, median and range.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 3: CELLS (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Structure and Function in Living Systems Standard: Understand that tissues, organs and organ systems are composed of cells and function to serve the needs of all cells for food, air and waste removal.	Recognize that all cells do not look alike and that specialized cells in multicellular organisms are organized into tissues and organs that perform specialized functions. (For Example: Nerve cells and skin cells do not look the same because they are part of different organs and have different functions.) (7.4.1.1.1)	• The functions of specialized cells are limited to recognition that nerve cells receive and transmit signals, muscle cells contract and relax, skin cells provide protection and blood cells carry gases. • Tissues are limited to muscle, nerve and skin tissues. • Organs and organ systems are limited to respiratory, circulatory, digestive, nervous, skin and urinary systems. • Items assessing this benchmark may also assess benchmark 7.4.1.1.2. • Items are limited to examples in humans.		Holt "Science and Technology: Cells, Heredity, and Classification" Kids Discover "Cells"
Substrand: Structure and Function in Living Systems Standard: Understand that tissues, organs and organ systems are composed of cells and function to serve the needs of all cells for food, air and waste removal.	Describe how the organs in the respiratory, circulatory, digestive, nervous, skin and urinary systems interact to serve the needs of vertebrate organisms. (7.4.1.1.2)	• Items will NOT require students to identify the structure or function of individual systems outside the context of system interaction. • Items assessing this benchmark may also assess benchmark 7.4.1.1.1.		Holt "Science and Technology: Cells, Heredity, and Classification"

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 3: CELLS (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Structure and Function in Living Systems Standard: Understand that all living organisms are composed of one or more cells which carry on the many functions needed to sustain life.	Recognize that cells carry out life functions, and that these functions are carried out in a similar way in all organisms, including animals, plants, fungi, bacteria and protists. (7.4.1.2.1)	• Life functions include obtaining and using energy. • Items will NOT require students to have specific knowledge about respiration, such as the Krebs cycle, or equations that describe respiration or photosynthesis. • Items may require students to make comparisons of the life functions of different organisms. • Items assessing this benchmark may also assess benchmarks 7.4.1.2.2.or 7.4.1.2.3.		Holt "Science and Technology: Cells, Heredity, and Classification" Kids Discover "Cells"
Substrand: Structure and Function in Living Systems Standard: Understand that all living organisms are composed of one or more cells which carry on the many functions needed to sustain life.	Recognize that cells repeatedly divide to make more cells for growth and repair. (7.4.1.2.2)	• Items may require students to understand how cells are replaced in an organism and how an organism gets larger. • Items will NOT require understanding the specific processes of mitosis and meiosis, although the term mitosis may be used. • Additional vocabulary may include terms such as cell division. • Items assessing this benchmark may also assess benchmarks 7.4.1.2.1 or 7.4.1.2.3.		Holt "Science and Technology: Cells, Heredity, and Classification"
Substrand: Structure and Function in Living Systems Standard: Understand that all living organisms are composed of one or more cells which carry on the many functions needed to sustain life.	Use the presence of the cell wall and chloroplasts to distinguish between plant and animal cells. (For Example: Compare microscopic views of plant cells and animal cells.) (7.4.1.2.3)	• Items assessing this benchmark may also assess benchmarks 7.4.1.2.1 or 7.4.1.2.2.		Holt "Science and Technology: Cells, Heredity, and Classification" Kids Discover "Cells"

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 4: HUMAN BODY

Big Questions	Formative/ Summative Assessments Formative and summative assessments created by teachers/teams
1. How do scientists design a controlled experiment? 2. How do scientists use evidence to support conclusions? 3. How do scientists use tools and data and keep themselves safe? 4. How do the structure of cells and organs help them do their jobs? 5. What elements are most prevalent in living things? 6. How are compounds different from molecules?	Options include, but are not limited to: • Human Body Research Project • Paper/Pencil Quiz and Test • Human Body Lab and Data Day • Pulse Lab and Muscle Flexibility Lab • Formative Assessment: line up, Jay's Lunch Story • Nature Journals

Substrand/Standard	Curriculum Benchmark	MCA III Test Item Specifications	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.** (7.1.1.2.1)	• Items may require students to determine if a given question is investigable in the context of science content. • Items may require students to determine if a given question is appropriate for specific methods of investigations. • Examples of controlled experiments may include testing motion using time, speed, mass and location as variables. • Examples of field studies may include sampling populations of living organisms. • Examples of review of existing work may include internet review of climate change. • Examples of development of models may include planetary models.		Nature All Year Long, by Claire Walker Leslie

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 4: HUMAN BODY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams).)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).** (For Example: The effect of various factors on the production of carbon dioxide by plants.) (7.1.1.2.2)	• Context for items may be from physical science, life science or Earth science areas. • Items may require students to identify a hypothesis, determine materials needed for the experiment or describe a procedure. • Items will NOT require students to identify a specific order of steps in an investigation. • Items may ask students to identify which variables are changed by the investigator, which are kept the same (controlled) and which are measured or observed. • Items will NOT use the terms independent variable, dependent variable, manipulated variable or responding variables. • Information used to specify variables must be provided.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).** (7.1.1.2.3)	• Items may require students to draw conclusions based on evidence. • Results (evidence) consist of observations and data on which to base scientific explanations. • Conclusions (explanations) are based on evidence from a single or a few related experiments that could be performed in a classroom setting. • Items assessing this benchmark may also assess benchmarks 8.1.1.1.1, 7.1.3.4.1 and 8.1.3.4.1.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Evaluate explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, and suggesting alternative explanations.** (7.1.1.2.4)	• Items may require students to evaluate whether the evidence supports the conclusion when evaluating explanations. • Items will NOT require students to evaluate the source of the evidence. • Items assessing this benchmark may also assess benchmark 7.1.1.1.1.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 4: HUMAN BODY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams).)	**Resources**
Substrand: Interactions Among Science, Technology, Engineering, Mathematics and Society Standard: Understand that current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.	Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a life science context. (7.1.3.4.2)	• Examples of tools include a Celsius thermometer, metric ruler, timer, electronic balance, microscope, hand lens and graduated cylinder. • Items may require students to determine the tool used to accurately measure a particular quantity. • Items may include constructing and analyzing graphs from a set of data and comparing graphs and data. • Mathematical analyses are limited to mean, median and range.		
Substrand: Matter Standard: Understand that the idea that matter is made up of atoms and molecules provides the basis for understanding the properties of matter.	Recognize that all substances are composed of one or more of approximately one hundred elements and that the periodic table organizes the elements into groups with similar properties. (7.2.1.1.1)	• Groupings will be limited to metals and nonmetals. • Items that refer to the periodic table will include relevant information from the periodic table. • Elements are defined as substances composed of one type of atom. • Items will NOT refer to protons, neutrons or electrons. • Items may require students to know that elements have unique properties but will NOT require students to identify elements by their properties.		The Periodic Table: Elements with Style, by Adrian Dingle The Elements, by Theodore Gray Open Me Up, by Dorling Kindersley
Substrand: Matter Standard: Understand that the idea that matter is made up of atoms and molecules provides the basis for understanding the properties of matter.	Describe the differences between elements and compounds in terms of atoms and molecules. (7.2.1.1.2)	• Items will NOT include chemical formulas or equations. • Items will NOT refer to protons, neutrons or electrons. • Elements are defined as a substance that cannot be broken down into any simpler chemical substances and is made of atoms all of the same type. • Compounds are defined as a substance formed by the reaction of two or more chemical elements. • Molecules are defined as the simplest unit of a chemical substance usually a group of two or more atoms.		National Geographic: "Matter, Matter Everywhere" (Reading Expeditions)

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 4: HUMAN BODY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams).)	**Resources**
Substrand: Structure and Function in Living Systems Standard: Understand that tissues, organs and organ systems are composed of cells and function to serve the needs of all cells for food, air and waste removal.	Describe how the organs in the respiratory, circulatory, digestive, nervous, skin and urinary systems interact to serve the needs of vertebrate organisms. (7.4.1.1.2)	• Items will NOT require students to identify the structure or function of individual systems outside the context of system interaction. • Items assessing this benchmark may also assess benchmark 7.4.1.1.1.		Holt "Science and Technology: Human Body Systems and Health Open Me Up, by Dorling Kindersley

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 5: GENETICS

Big Questions	Formative/ Summative Assessments Formative and summative assessments created by teachers/teams
• What is the relationship between DNA, genes and chromosomes? • How do parents pass traits on to offspring? • How do scientists use pedigree charts and punnett squares to predict the likelihood that offspring will inherit certain traits? • How does the environment affect inherited traits?	Options include, but are not limited to: • Formative Assessments: Check for Understanding (vocabulary) and Create Your Own Punnett Square Problems • Genetic Vocabulary Story • Pedigree Assignment • Paper/Pencil Test • Nature Journals

Substrand/Standard	Curriculum Benchmark	MCA III Test Item Specifications	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Substrand: Evolution in Living Systems Standard: Understand that reproduction is a characteristic of all organisms and is essential for the continuation of a species. Hereditary information is contained in genes which are inherited through asexual or sexual reproduction.	Recognize that cells contain genes and that each gene carries a single unit of information that either alone, or with other genes, determines the inherited traits of an organism. *(7.4.3.1.1)*	• Items will NOT use the terms chromosome, phenotype, genotype, dominant or recessive. • Items will NOT require students to understand or use a Punnett square.		Holt "Science and Technology Cells, Heredity and Classification"
Substrand: Evolution in Living Systems Standard: Understand that reproduction is a characteristic of all organisms and is essential for the continuation of a species. Hereditary information is contained in genes which are inherited through asexual or sexual reproduction.	Distinguish between characteristics of organisms that are inherited and those acquired through environmental influences. *(7.4.3.1.3)*	• Items will provide relevant background information. • Items may address how some inherited traits can also be affected by the environment. For example, mutations caused by pollution, organism height, leaf number, leaf color. • Additional vocabulary may include terms such as instinctive, behavioral and learned characteristics.		Holt "Science and Technology Cells, Heredity and Classification" McDougal Littel "Life Science"
Substrand: Human Interactions with Living Systems Standard: Understand that human activity can change living organisms and ecosystems.	Describe examples where selective breeding has resulted in new varieties of cultivated plants and particular traits in domesticated animals. *(7.4.4.1.1)*	• Items will provide relevant background information on traits found in the plants and animals.		

UNIT 4: HUMAN BODY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams).)	**Resources**
Substrand: Human Interactions with Living Systems Standard: Understand that human activity can change living organisms and ecosystems.	Describe examples where selective breeding has resulted in new varieties of cultivated plants and particular traits in domesticated animals. (7.4.4.1.1)	• Items will provide relevant background information on traits found in the plants and animals.		McDougal Littel "Life Science"
Substrand: Evolution in Living systems Standard: Understand that reproduction is a characteristic of all organisms and is essential for the continuation of a species. Hereditary information is contained in genes which are inherited through asexual or sexual reproduction.	Recognize that in asexually reproducing organisms all the genes come from a single parent, and that in sexually reproducing organisms about half of the genes come from each parent. (7.4.3.1.2)	• Items will NOT require students to understand the process of meiosis. • Items may require students to know that sex cells contain half the total genetic information. • Items will NOT use the term chromosome.		Holt "Science and Technology: Cells, Heredity and Classification"

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 6: MICROBIOLOGY

Big Questions	Formative/ Summative Assessments Formative and summative assessments created by teachers/teams
1. What challenges have scientists encountered as the presented their work? 2. How do scientists design a controlled experiment? 3. How do scientists use evidence to support conclusions? 4. How do scientists use evidence to get data and keep themselves safe? 5. How do viruses, bacteria, fungi and parasites infect the human body and interfere with functions? 6. What are the differences between viruses and bacteria? 7. How are infectious diseases prevented and treated?	Options include, but are not limited to: • Handwashing Lab • Book Group posters or book reports • Formative assessments: card sort, Venn diagrams, signal word sentences and interview grid activity • Paper/pencil test • Nature Journals

Substrand/Standard	Curriculum Benchmark	MCA III Test Item Specifications	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Substrand: The Practice of Science Standard: Understand that science is a way of knowing about the natural world and is characterized by empirical criteria, logical argument and skeptical review.	**Understand that prior expectations can create bias when conducting scientific investigations. (**For Example: Students often continue to think that air is not matter, even though they have contrary evidence from investigations.) (7.1.1.1.1)	• Items may address common preconceptions of middle level students. • Items assessing this benchmark may also assess benchmark 7.1.1.2.4.		With a Little Luck, by Dennis Fradin
Substrand: The Practice of Science Standard: Understand that science is a way of knowing about the natural world and is characterized by empirical criteria, logical argument and skeptical review.	**Understand that when similar investigations give different results, the challenge is to judge whether the differences are significant, and if further studies are required.** (For Example: Use mean and range to analyze the reliability of experimental results.) (7.1.1.1.2)	• Items may require students to compare statistical data from different investigations. • Items will NOT require students to make statistical calculations. • Statistics provided will be limited to mean, median and range. • Items may include qualitative or quantitative data. • Items may include graphs and tables to represent investigation results. • Items will NOT include the terms reliability and validity.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 6: MICROBIOLOGY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.** (7.1.1.2.1)	• Items may require students to determine if a given question is investigable in the context of science content. • Items may require students to determine if a given question is appropriate for specific methods of investigations. • Examples of controlled experiments may include testing motion using time, speed, mass and location as variables. • Examples of field studies may include sampling populations of living organisms. • Examples of review of existing work may include internet review of climate change. • Examples of development of models may include planetary models.		Nature All Year Long, by Claire Walker Leslie
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).** (For Example: The effect of various factors on the production of carbon dioxide by plants.) (7.1.1.2.2)	• Context for items may be from physical science, life science or Earth science areas. • Items may require students to identify a hypothesis, determine materials needed for the experiment or describe a procedure. • Items will NOT require students to identify a specific order of steps in an investigation. • Items may ask students to identify which variables are changed by the investigator, which are kept the same (controlled) and which are measured or observed. • Items will NOT use the terms independent variable, dependent variable, manipulated variable or responding variables. • Information used to specify variables must be provided.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 6: MICROBIOLOGY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).** (7.1.1.2.3)	• Items may require students to draw conclusions based on evidence. • Results (evidence) consist of observations and data on which to base scientific explanations. • Conclusions (explanations) are based on evidence from a single or a few related experiments that could be performed in a classroom setting. • Items assessing this benchmark may also assess benchmarks 8.1.1.1.1, 7.1.3.4.1 and 8.1.3.4.1.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Evaluate explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, and suggesting alternative explanations.** (7.1.1.2.4)	• Items may require students to evaluate whether the evidence supports the conclusion when evaluating explanations. • Items will NOT require students to evaluate the source of the evidence. • Items assessing this benchmark may also assess benchmark 7.1.1.1.1.		With a Little Luck, by Dennis Fradin
Substrand: Interactions Among Science, Technology, Engineering, Mathematics and Society Standard: Understand that current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.	Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a life science context. (7.1.3.4.2)	• Examples of tools include a Celsius thermometer, metric ruler, timer, electronic balance, microscope, hand lens and graduated cylinder. • Items may require students to determine the tool used to accurately measure a particular quantity. • Items may include constructing and analyzing graphs from a set of data and comparing graphs and data. • Mathematical analyses are limited to mean, median and range.		

UNIT 6: MICROBIOLOGY (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Human Interactions with Living Systems Standard: Understand that human beings are constantly interacting with other organisms that cause disease.	Explain how viruses, bacteria, fungi and parasites may infect the human body and interfere with normal body functions. (7.4.4.2.1)	• Items will provide relevant background information regarding the biological agent. • Items will NOT require students to understand the cellular processes of infection.		Holt "Science and Technology: Microorganisms, Fungi and Plants" Rice University Medical Mystery Website: http://medmyst.rice.edu/
Substrand: Human Interactions with Living Systems Standard: Understand that human beings are constantly interacting with other organisms that cause disease.	Recognize that a microorganism can cause specific diseases and that there are a variety of medicines available that can be used to combat a given microorganism. (7.4.4.2.2)	• Items may require students to differentiate between treatments for different biological agents. • Items will NOT reference specific drugs used for specific diseases (e.g., amoxicillin for treating strep throat).		Holt "Science and Technology: Microorganisms, Fungi and Plant" (22 trade books offered as a choice for book group)
Substrand: Human Interactions with Living Systems Standard: Understand that human beings are constantly interacting with other organisms that cause disease.	Recognize that vaccines induce the body to build immunity to a disease without actually causing the disease itself. (7.4.4.2.3)	None.		Holt "Science and Technology: Microorganisms, Fungi and Plants" Rice University Medical Mystery Info Sheet
Substrand: Human Interactions with Living Systems Standard: Understand that human beings are constantly interacting with other organisms that cause disease.	Recognize that the human immune system protects against microscopic organisms and foreign substances that enter from outside the body and against some cancer cells that arise from within. (7.4.4.2.4)	• Items will NOT require students to understand the mechanisms of the immune response.		Holt "Science and Technology: Microorganisms, Fungi and Plants"
Substrand: Human Interactions with Living Systems Standard: Understand that human activity can change living organisms and ecosystems.	Describe ways that human activities can change the populations and communities in an ecosystem. (7.4.4.1.2)	• Change as a result of human activities may include chemicals in the environment, bacterial resistance, pollution, deforestation, over-hunting and urban development. • Items may require students to describe the effects of human activity when given an example.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 7: CLASSIFICATION AND THE KINGDOMS OF LIFE

Big Questions	Formative/ Summative Assessments Formative and summative assessments created by teachers/teams
• How do scientists design a controlled experiment? • How do scientists use evidence to support conclusions? • How do scientists use evidence to get data and keep themselves safe? • How do organisms change over time through natural selection? • How do fossils and anatomical structures support the theory of evolution? • How do fungi replicate? • How can photosynthesis be summarized in a chemical equation?	Options include, but are not limited to: • Plant lab or Seed Germination Lab • Plant Field Study • Invertebrate Behavior Lab • Paper/Pencil Tests • Create a Creature Project • Formative Assessments: line up, how-to manual for photosynthesis • Nature Journals

Substrand/Standard	Curriculum Benchmark	MCA III Test Item Specifications	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.** (7.1.1.2.1)	• Items may require students to determine if a given question is investigable in the context of science content. • Items may require students to determine if a given question is appropriate for specific methods of investigations. • Examples of controlled experiments may include testing motion using time, speed, mass and location as variables. • Examples of field studies may include sampling populations of living organisms. • Examples of review of existing work may include internet review of climate change. • Examples of development of models may include planetary models.		Field Manuals: Golden, Audubon Society, Trees of Minnesota

UNIT 7: CLASSIFICATION AND THE KINGDOMS OF LIFE (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).** (For Example: The effect of various factors on the production of carbon dioxide by plants.) (7.1.1.2.2)	• Context for items may be from physical science, life science or Earth science areas. • Items may require students to identify a hypothesis, determine materials needed for the experiment or describe a procedure. • Items will NOT require students to identify a specific order of steps in an investigation. • Items may ask students to identify which variables are changed by the investigator, which are kept the same (controlled) and which are measured or observed. • Items will NOT use the terms independent variable, dependent variable, manipulated variable or responding variables. • Information used to specify variables must be provided.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).** (7.1.1.2.3)	• Items may require students to draw conclusions based on evidence. • Results (evidence) consist of observations and data on which to base scientific explanations. • Conclusions (explanations) are based on evidence from a single or a few related experiments that could be performed in a classroom setting. • Items assessing this benchmark may also assess benchmarks 8.1.1.1.1, 7.1.3.4.1 and 8.1.3.4.1.		
Substrand: The Practice of Science Standard: Understand that scientific inquiry uses multiple interrelated processes to investigate questions and propose explanations about the natural world.	**Evaluate explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, and suggesting alternative explanations.** (7.1.1.2.4)	• Items may require students to evaluate whether the evidence supports the conclusion when evaluating explanations. • Items will NOT require students to evaluate the source of the evidence. • Items assessing this benchmark may also assess benchmark 7.1.1.1.1.		

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 7: CLASSIFICATION AND THE KINGDOMS OF LIFE (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Interactions Among Science, Technology, Engineering, Mathematics and Society Standard: Understand that current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.	Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a life science context. (7.1.3.4.2)	• Examples of tools include a Celsius thermometer, metric ruler, timer, electronic balance, microscope, hand lens and graduated cylinder. • Items may require students to determine the tool used to accurately measure a particular quantity. • Items may include constructing and analyzing graphs from a set of data and comparing graphs and data. • Mathematical analyses are limited to mean, median and range.		
Substrand: Interdependence Among Living Systems Standard: Understand that the flow of energy and the recycling of matter are essential to a stable ecosystem.	Recognize that producers use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms. (7.4.2.2.1)	• Descriptions of photosynthesis are limited to words and graphic representations, NOT chemical reactions with formulas. • Items may include the terms carbon dioxide and oxygen. • Items will NOT use the terms chlorophyll or glucose.		Holt "Science and Technology: Microorganisms, Fungi and Plants" McDougal Littel "Life Science" Kids Discover "Plants" The Visual Dictionary of Plants (Eyewitness Visual Dictionary) Field Guide: Trees
Substrand: Matter Standard: Understand that the idea that matter is made up of atoms and molecules provides the basis for understanding the properties of matter.	Recognize that a chemical equation describes a reaction where pure substances change to produce one or more pure substances whose properties are different from the original substance(s). (7.2.1.1.3)	• Chemical equations will be represented by word or graphical representations and will NOT include chemical formulas.		
Substrand: Evolution in Living System Standard: Understand that individual organisms with certain traits in particular environments are more likely than others to survive and have offspring.	Explain how the fossil record documents the appearance, diversification and extinction of many life forms. (7.4.3.2.1)	• Items will NOT require students to recall specific fossils, geologic time periods or absolute ages.		McDougal Littel "Life Science"

GRADE 7: SCIENCE CURRICULUM FRAMEWORKS

UNIT 7: CLASSIFICATION AND THE KINGDOMS OF LIFE (continued)				
Substrand/Standard	**Curriculum Benchmark**	**MCA III Test Item Specifications**	**Standards of Proficiency** Description of what students must show to demonstrate proficiency (created by teachers/teams)	**Resources**
Substrand: Evolution in Living System Standard: Understand that individual organisms with certain traits in particular environments are more likely than others to survive and have offspring.	Use internal and external anatomical structures to compare and infer relationships between living organisms as well as those in the fossil record. (7.4.3.2.2)	• Items may require students to interpret cladograms but will not use this term. • Items will NOT use the terms DNA, phylogeny, homologous structures, analogous structures. • Additional vocabulary may include terms such as common ancestor.		McDougal Littel "Life Science"
Substrand: Evolution in Living System Standard: Understand that individual organisms with certain traits in particular environments are more likely than others to survive and have offspring.	Recognize that variation exists in every population and describe how a variation can help or hinder an organism's ability to survive. (7.4.3.2.3)	• Additional vocabulary may include terms such as adaptation, genetic diversity.		
Substrand: Evolution in Living System Standard: Understand that individual organisms with certain traits in particular environments are more likely than others to survive and have offspring.	Recognize that extinction is a common event and it can occur when the environment changes and a population's ability to adapt is insufficient to allow its survival. (7.4.3.2.4)	• Items may require students to use evidence from the fossil record to show extinction as a common event throughout Earth's history. • Items will NOT require students to understand that a population's ability to adapt can result in an increase in the population.		
Substrand: Structure and Function in Living Systems Standard: Understand that tissues, organs and organ systems are composed of cells and function to serve the needs of all cells for food, air and waste removal.	Describe how the organs in the respiratory, circulatory, digestive, nervous, skin and urinary systems interact to serve the needs of vertebrate organisms. (7.4.1.1.2)	• Items will NOT require students to identify the structure or function of individual systems outside the context of system interaction. • Items assessing this benchmark may also assess benchmark 7.4.1.1.1.		Holt "Science and Technology: Animals and Health"