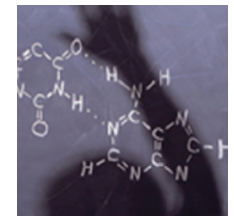
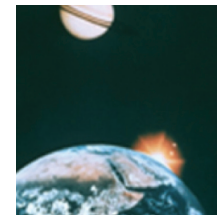


# Grade 5 Science

## STAAR Field Guide



**STAAR**

The State of Texas of Assessment of Academic Readiness (STAAR) is based on the Texas Essential Knowledge and Skills (TEKS). Most of the state standards, if they are eligible for assessment in a multiple choice/short answer format, will be assessed on STAAR.

STAAR is designed as a vertical system. Just as the TEKS are structured in a vertically aligned manner, so is STAAR. Learning from one grade level is aligned with learning at the next grade level. Some skills are developed over the course of a student’s educational career from kindergarten through high school, while other skills and learning may begin at a particular grade level and serve as the foundation for later learning. STAAR is an assessment of academic readiness. In other words, we can sum up the variation between the current assessment program (TAKS) and STAAR by reframing the questions we are asking.

**TAKS:** TAKS was designed to help teachers answer this question:

- Did students learn what they were supposed to learn in the current year’s grade?

**STAAR:** STAAR is designed to ensure that teachers answer these questions:

- Did students learn what they were supposed to learn in the current year’s grade?
- Are students ready for the next grade?
- And are they also ready for the grade after that?

So what’s the big deal about that shift? Fundamentally, it requires that teachers relook at curriculum and instruction in a very different way than they have under previous assessment systems (TABS, TEAMS, TAAS, TAKS). Not only are teachers required to have a deep understanding of the content of the grade level they are teaching, but they must also be firmly grounded in how the content of that current grade level prepares students for subsequent grade levels. Overemphasis on grade level attainment ONLY may create a context where teachers in subsequent grade levels have to reteach foundational skills to accommodate for the gap created by the lack of appropriate emphasis earlier. It may require students “unlearn” previous ways of conceptualizing content and essentially start all over.

**STAAR: focus, clarity, depth**

[The TEKS] are designed to prepare students to succeed in college, in careers and to compete globally. However, consistent with a growing national consensus regarding the need to provide a more clearly articulated K–16 education program that focuses on fewer skills and addresses those skills in a deeper manner (TEA).

STAAR is designed around three concepts: focus, clarity, and depth:

**Focus:** STAAR will focus on grade level standards that are critical for that grade level and the ones to follow.

**Clarity:** STAAR will assess the eligible TEKS at a level of specificity that allow students to demonstrate mastery.

**Depth:** STAAR will assess the eligible TEKS at a higher cognitive level and in novel contexts.

**STAAR: the assessed curriculum – readiness, supporting, and process standards**

A key concept that underpins the design of STAAR is that all standards (TEKS) do not play the same role in student learning. Simply stated, some standards (TEKS) have greater priority than others – they are so vital to the current grade level or content area that they must be learned to a level of mastery to ensure readiness (success) in the next grade levels. Other standards are important in helping to support learning, to maintain a previously learned standard, or to prepare students for a more complex standard taught at a later grade.

By assessing the TEKS that are most critical to the content area in a more rigorous ways, STAAR will better measure the academic performance of students as they progress from elementary to middle to high school. Based on educator committee recommendations, for each grade level or course, TEA has identified a set of readiness standards - the TEKS which help students develop deep and enduring understanding of the concepts in each content area. The remaining knowledge and skills are considered supporting standards and will be assessed less frequently, but still play a very important role in learning.

**Readiness standards** have the following characteristics:

- They are essential for success in the current grade or course.
- They are important for preparedness for the next grade or course.
- They support college and career readiness.
- They necessitate in-depth instruction.
- They address broad and deep ideas.

**Supporting standards** have the following characteristics:

- Although introduced in the current grade or course, they may be emphasized in a subsequent year.
- Although reinforced in the current grade or course, they may be emphasized in a previous year.
- They play a role in preparing students for the next grade or course but not a central role.
- They address more narrowly defined ideas.

**STAAR assesses the eligible TEKS at the level at which the TEKS were written.**

STAAR is a more rigorous assessment than TAKS (and TAAS, TEAMS, TABS before that). The level of rigor is connected with the cognitive level identified in the TEKS themselves. Simply stated, STAAR will measure the eligible TEKS at the level at which they are written.

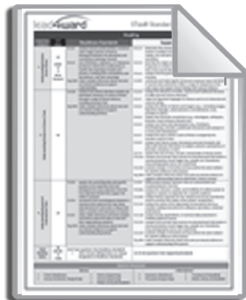
The rigor of items will be increased by

- assessing content and skills at a greater depth and higher level of cognitive complexity
- assessing more than one student expectation in a test item

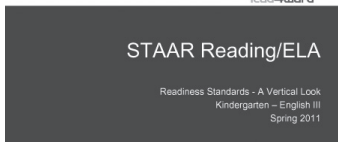
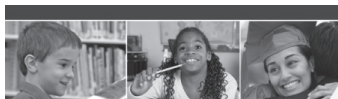
The rigor of the tests will be increased by

- assessing fewer, yet more focused student expectations and assessing them multiple times and in more complex ways
- including a greater number of rigorous items on the test, thereby increasing the overall test difficulty

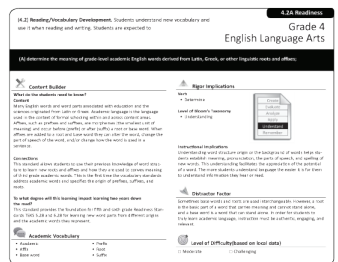
The STAAR Field Guide for Teachers is designed as a tool to help teachers prepare for instruction. The tools and resources in this guide are designed to supplement local curriculum documents by helping teachers understand how the design and components of STAAR are connected to the scope and sequence of instruction. In order to help students attain even higher levels of learning as assessed on STAAR, teachers need to plan for increasing levels of rigor. This guide contains the following components:



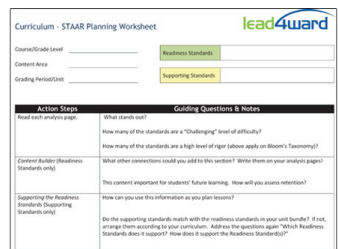
**STAAR Grade Level Snapshot** – one page overview of the standards assessed on STAAR, how those standards are classified (readiness, supporting, or process), the reporting categories around which those standards are clustered, and the number of items that will be on the test from each reporting category and from each type of standard.



**STAAR Readiness Standards: A Vertical Look** – a vertical look at the readiness standards in grade bands to show the progression of the assessment between grade levels



**STAAR Readiness and Supporting Standards Analysis Sheets**– overviews of the nature of each readiness and supporting standard assessed on STAAR, designed to be used in planning to build teacher content knowledge and ensure that current grade level instruction reinforces previous learning and prepares students for future grade levels.



**STAAR-Curriculum Planning Worksheet** – a tool to organize the pages in this guide to be used in planning and professional development

## **Steps to Success**

1. Download the TEA Documents to add to your STAAR Teacher Field Guide
  - STAAR Blueprint
  - Assessed Curriculum Documents
  - STAAR Test Design
  - STAAR Reference Materials
2. Review the STAAR Snapshot for your course/grade level and content area
  - Note the readiness standards
  - With your team, explore why those TEKS are classified as readiness standards – which criteria do they meet
  - Review the supporting standards and note any that may have played a larger role on TAKS
3. Review the STAAR Readiness Standards: A Vertical Look
  - Discuss how the readiness standards connect between grade levels
  - Explore the specific differences between the aligned readiness standards at each grade level
4. Review the components of the STAAR Readiness and Supporting Standards Analysis Sheets
  - Use the samples on pages 6 and 7 to explore the analysis sheets
  - Add additional information based on the discussion on the team
5. Create STAAR-Curriculum Planning Packets for each unit or grading period
  - Collect either the Scope and Sequence document (if it includes the TEKS standards for each unit of instruction) OR Unit Plan documents (where the TEKS standards are bundled together into units of instruction)
  - The STAAR Field Guide is arranged by standard type (readiness or supporting) in numeric order of the standards. You may need to photocopy certain pages/standards if they are repeated throughout multiple units.
  - Use the scope and sequence or unit plan documents to identify the TEKS taught in each unit/grading period
  - Compile the STAAR Readiness and Supporting Standards Analysis Sheets that correspond to the TEKS each unit/grading period
  - After the pages/standards are sorted into their appropriate unit, create a method of organizing the documents (binder, folder, file, etc).
6. Plan for instruction
  - Collect the curriculum documents used for planning
  - Use the STAAR- Curriculum Planning Worksheet as you plan each unit. The worksheet provides guiding questions and reflection opportunities to aide you in maximizing the material in the STAAR Field Guide.
  - Determine where the team needs additional learning
  - Evaluate instructional materials
  - Review the plan for appropriate levels of rigor

## How to read STAAR Readiness Standards analysis pages

Student Expectation

Texas Essential Knowledge and Skills Statement

Standard and Indication of "Readiness" or "Supporting"

Grade and Subject

**5.3A Readiness**  
Grade 5 Math

(5.3) Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve meaningful problems. The student is expected to

**(A) use addition and subtraction to solve problems involving whole numbers and decimals;**

**Content Builder**  
What do the students need to know?  
Content  

- Addition
- Whole numbers
- Decimals
- Subtraction
- Whole numbers
- Decimals

Connections  
In previous grades students added and subtracted decimals to the hundredths place using concrete objects and pictorial models. This supports the learning in grade 5 as students are using addition and subtraction to solve problems involving decimals.  
To what degree will this learning impact learning two years down the road?  
This learning will impact future learning as students will continue to be asked to use addition, subtraction, multiplication, and division to solve problems involving fractions and decimals.

**Rigor Implications**  
Verb  

- Add
- Subtract
- Solve

Level of Bloom's Taxonomy  

- Applying

Instructional Implications  
To appropriately adhere to the standard, students should be provided the opportunity to solve a variety of problems using addition and subtraction involving both whole numbers and decimals.

**Academic Vocabulary**  

- Add
- Subtract
- Decimal

**Distractor Factor**  
Teachers should look for students who may be struggling with the addition when the whole is broken up into a decimal, or when the decimals add up to more than a whole.

**Level of Difficulty**

**Content Builder-** The basics of the content within the standard are extracted in a bulleted list. Connections to prior learning/other standards are explained. Future implications of mastery of this standard are described to assist in understanding the impact of this learning in the future.

**Rigor Implications-** Uses the verb(s) from the Student Expectation to indicate the cognitive complexity of the standard and which level of Bloom's Taxonomy should be addressed during instruction, Instructional implications are also highlighted.

**Distractor Factor -** Alerts teachers to areas where students traditionally struggle, have misconceptions, or may need reinforcement.

**Academic Vocabulary-** Vocabulary words are extracted directly from the standard and/or associated with the instruction of the content within the standard.

**Level of Difficulty-** Standards are labeled either Challenging or Moderate. This determination is made by the campus using previous year data.



## How to read STAAR Supporting Standards analysis pages

Student Expectation

Texas Essential Knowledge and Skills Statement

Standard and Indication of "Readiness" or "Supporting"

Grade and Subject

(5.1) Number, operation, and quantitative reasoning. The student uses place value to represent whole numbers and decimals. The student is expected to

**5.1B Supporting**  
Grade 5 Math

**(B) use place value to read, write, compare, and order decimals through the thousandths place.**

**Supporting the Readiness Standards**

What Readiness Standard(s) or concepts from the Readiness Standards does it support?  
5.3A use addition and subtraction to solve problems involving whole numbers and decimals.

How does it support the Readiness Standard(s)?  
This standard supports 5.3A by providing students continued practice reading, writing, comparing, and ordering decimals. This will support students as they solve addition and subtraction problems involving decimals.

*May be adjusted according to local curriculum.*

**Academic Vocabulary**

- Compare
- Order
- Decimal
- Tenths
- Hundredths
- Thousandths


**Rigor Implications**

Verb

- Write
- Compare
- Order

Level of Bloom's Taxonomy

- Analyzing



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to practice reading numbers aloud using place value, writing numbers that have been dictated using place value, and comparing and ordering decimals based on their the value.

**Supporting the Readiness Standards** - Most supporting standards support a readiness standard in the current grade level. This section discusses the relationships of the standards that are often taught together.

**Rigor Implications**- Uses the verb(s) from the Student Expectation to indicate the cognitive complexity of the standard and which level of Bloom's Taxonomy should be addressed during instruction, Instructional implications are also highlighted.

**Academic Vocabulary**- Words are extracted directly from the standard and/or associated with the instruction of the content within the standard.

# Curriculum - STAAR Planning Worksheet



Course/Grade Level \_\_\_\_\_

Readiness Standards	
---------------------	--

Content Area \_\_\_\_\_

Grading Period/Unit \_\_\_\_\_

Supporting Standards	
----------------------	--

Action Steps	Guiding Questions & Notes
Read each analysis page.	<p>What stands out?</p> <p>How many of the standards are a “Challenging” level of difficulty?</p> <p>How many of the standards are a high level of rigor (above apply on Bloom’s Taxonomy)?</p>
<i>Content Builder</i> (Readiness Standards only)	<p>What other connections could you add to this section? Write them on your analysis pages!</p> <p>This content important for students’ future learning. How will you assess retention?</p>
<i>Supporting the Readiness Standards</i> (Supporting Standards only)	<p>How can you use this information as you plan lessons?</p> <p>Do the supporting standards match with the readiness standards in your unit bundle? If not, arrange them according to your curriculum. Address the questions again “Which Readiness Standards does it support? How does it support the Readiness Standard(s)?”</p>



## Curriculum - STAAR Planning Worksheet



Action Steps	Guiding Questions & Notes
Vocabulary	<p>What strategies will you use to ensure mastery of the vocabulary for each standard in this unit?</p> <p>What is your plan if students do not master the vocabulary?</p>
Use the <i>Distractor Factor</i>	<p>How can you address the information in the Distractor Factor section?</p> <p>From your teaching experience, is there anything you would add to this? Write it on your analysis pages!</p>
<b>Reflection</b>	<p>How have you taught this content in the past?</p> <p>How will you teach it differently this year?</p> <p>How will you utilize the readiness and supporting standards for formative and summative assessment?</p>

Reporting Category	# of Items	Readiness Standards	Supporting Standards
1 Matter and Energy	8	5.5.A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy	5.5.B identify the boiling and freezing/melting points of water on the Celsius scale 5.5.C demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand 5.5.D identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water
		5.6.A explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy 5.6.B demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound 5.6.C demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water	3.5.C predict, observe, and record changes in the state of matter caused by heating or cooling 5.6.D design an experiment that tests the effect of force on an object 3.6.B demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons
2 Force, Motion and Energy	10	5.7.A explore the processes that led to the formation of sedimentary rocks and fossil fuels 5.7.B recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice 5.7.C identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels 5.8.C demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky	5.7.D identify fossils as evidence of past living organisms and the nature of the environments at the time using models 5.8.A differentiate between weather and climate 5.8.B explain how the Sun and the ocean interact in the water cycle 5.8.D identify and compare the physical characteristics of the Sun, Earth, and Moon 4.7.A examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants 4.7.C identify and classify Earth's renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation 4.8.A measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key 4.8.B describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process 4.8.C collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time
		5.9.A observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements 5.9.B describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers 5.10.A compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals 5.10.B differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle	3.7.B investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides 3.8.D identify the planets in Earth's solar system and their position in relation to the Sun 5.9.C predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways 5.9.D identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals 5.10.C describe the differences between complete and incomplete metamorphosis of insects 3.9.A observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem 3.10.C investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs
3 Earth and Space	12		
4 Organisms and Environments	14		
Total Items	44 (43 MC & 1 Grid)	26-29 test questions from Readiness Standards	
		15-18 test questions from Supporting Standards	

## Scientific Investigation and Reasoning Skills

Scientific Investigation and Reasoning Skills		
5.1.A	≥ 40% of items will be dual coded	5.1.A demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations 5.1.B make informed choices in the conservation, disposal, and recycling of materials 5.2.A describe, plan, and implement simple experimental investigations testing one variable 5.2.B ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology 5.2.C collect information by detailed observations and accurate measuring 5.2.D analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence 5.2.E demonstrate that repeated investigations may increase the reliability of results 5.2.F communicate valid conclusions in [both] written [and verbal] form[s] 5.2.G construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information 5.3.A in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student 5.3.B evaluate the accuracy of the information related to promotional materials for products and services such as nutritional labels 5.3.C draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works 5.3.D connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists 5.4.A collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, pan balances, triple beam balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices, including clocks and stopwatches; and materials to support observations of habitats or organisms such as terrariums and aquariums 5.4.B use safety equipment, including safety goggles and gloves

Reporting Category	Grade 5 Supporting Standards (from Grade 3)	Grade 5 Supporting Standards (from Grade 4)	Grade 5 Readiness Standards
1 Matter and Energy	3.5.C predict, observe, and record changes in the state of matter caused by heating or cooling		5.5.A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy
2 Force, Motion and Energy	3.6.B demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons		5.6.A explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy  5.6.B demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound  5.6.C demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water
3 Earth and Space	3.7.B investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides  3.8.D identify the planets in Earth's solar system and their position in relation to the Sun	4.7.A examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants  4.7.C identify and classify Earth's renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation  4.8.A measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key  4.8.B describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process  4.8.C collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time	5.7.A explore the processes that led to the formation of sedimentary rocks and fossil fuels  5.7.B recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice  5.7.C identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels  5.8.C demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky

Reporting Category	Grade 5 Supporting Standards (from Grade 3)	Grade 5 Supporting Standards (from Grade 4)	Grade 5 Readiness Standards
4 Organisms and Environments	<p>3.9.A observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem</p> <p>3.10.C investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs</p>		<p>5.9.A observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements</p> <p>5.9.B describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers</p> <p>5.10.A compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals</p> <p>5.10.B differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle</p>

## Grade 5 Scientific Investigation and Reasoning Skills

- 5.1.A demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations
- 5.1.B make informed choices in the conservation, disposal, and recycling of materials
- 5.2.A describe, plan, and implement simple experimental investigations testing one variable
- 5.2.B ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology
- 5.2.C collect information by detailed observations and accurate measuring
- 5.2.D analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence
- 5.2.E demonstrate that repeated investigations may increase the reliability of results
- 5.2.F communicate valid conclusions in [both] written [and verbal] form[s]
- 5.2.G construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information
- 5.3.A in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student
- 5.3.B evaluate the accuracy of the information related to promotional materials for products and services such as nutritional labels
- 5.3.C draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works
- 5.3.D connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists
- 5.4.A collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, pan balances, triple beam balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices, including clocks and stopwatches; and materials to support observations of habitats or organisms such as terrariums and aquariums
- 5.4.B use safety equipment, including safety goggles and gloves

Reporting Category	Grade 5 Readiness Standards	Grade 8 Supporting Standards (from Grade 6)	Grade 8 Supporting Standards (from Grade 7)	Grade 8 Readiness Standards
1 Matter and Energy	5.5.A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy	6.5.C differentiate between elements and compounds on the most basic level  6.6.A compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability  6.6.B calculate density to identify an unknown substance	7.5.C diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids  7.6.A identify that organic compounds contain carbon and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur  7.6.B distinguish between physical and chemical changes in matter in the digestive system	8.5.A describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud  8.5.B identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity  8.5.C interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements  8.5.D recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts  8.5.E investigate how evidence of chemical reactions indicate that new substances with different properties are formed
2 Force, Motion and Energy	5.6.A explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy  5.6.B demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound  5.6.C demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water	6.8.A compare and contrast potential and kinetic energy  6.8.C calculate average speed using distance and time measurements  6.8.D measure and graph changes in motion  6.9.C demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy	7.7.A contrast situations where work is done with different amounts of force to situations where no work is done such as moving a box with a ramp and without a ramp, or standing still	8.6.A demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion  8.6.C investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches
3 Earth and Space	5.7.A explore the processes that led to the formation of sedimentary rocks and fossil fuels  5.7.B recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice  5.7.C identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels  5.8.C demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky			8.7.A model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons  8.7.B demonstrate and predict the sequence of events in the lunar cycle  8.8.A describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification  8.9.B relate plate tectonics to the formation of crustal features  8.9.C interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering



Reporting Category	Grade 5 Readiness Standards	Grade 8 Supporting Standards (from Grade 6)	Grade 8 Supporting Standards (from Grade 7)	Grade 8 Readiness Standards
4 Organisms and Environments	5.9.A observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements	6.12.D identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms	7.10.B describe how biodiversity contributes to the sustainability of an ecosystem	8.11.A describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems
	5.9.B describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers		7.10.C observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds	8.11.B investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water, range of temperatures, or soil composition
	5.10.A compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals		7.11.A examine organisms or their structures such as insects or leaves and use dichotomous keys for identification	8.11.C explore how short-and long-term environmental changes affect organisms and traits in subsequent populations
	5.10.B differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle		7.11.C identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch ( <i>Geospiza fortis</i> ) or domestic animals	
		7.12.B identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems		
		7.12.D differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole		
		7.12.F recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life		
		7.14.B compare the results of uniform or diverse offspring from sexual reproduction or asexual reproduction		
		7.14.C recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus		

## Grade 8 Scientific Investigation and Reasoning Skills

8.1.A	demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards
8.1.B	practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials
8.2.A	plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology
8.2.B	design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology
8.2.C	collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers
8.2.D	construct tables and graphs, using repeated trials and means, to organize data and identify patterns
8.2.E	analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends
8.3.A	in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student
8.3.B	use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature
8.3.C	identify advantages and limitations of models such as size, scale, properties, and materials
8.3.D	relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content
8.4.A	use appropriate tools to collect, record, and analyze information, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrometers, timing devices, and other equipment as needed to teach the curriculum
8.4.B	use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher

## Grade 5 Science

**(5.5) Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

**(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy;**



### Content Builder

**What do the students need to know?**

#### Content

- Mass
- Magnetism
- Physical state (solid, liquid, gas)
- Relative density (sinking and floating)
- Solubility in water
- Strength
- The ability to conduct or insulate thermal or electric energy
- Hardness
- Flexibility
- Durability
- Resistance to water
- Resistance to fire

#### Connections

In grade 03, students measured, tested, and recorded physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float in water. By grade 04, students also contrasted the physical properties of matter with the additional properties of size, volume, physical state, and buoyancy.

#### To what degree will this learning impact learning two years down the road?

In grade 06, students must be familiar with the physical properties of matter in order to test the physical properties of minerals as well as to compare metals, nonmetals, and metalloids using physical properties. In grade 07, students must be familiar with physical and chemical properties in order to recognize that they can undergo physical and chemical changes.



### Academic Vocabulary

- Matter
- Properties
- Solution
- Relative Density



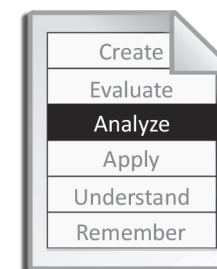
### Rigor Implications

#### Verb

- Classify

#### Level of Bloom's Taxonomy

- Analyzing



#### Instructional Implications

To appropriately adhere to the standard, students should be provided with experiences that allow them to classify various types of matter based on their physical properties including mass, magnetism, physical state (solid, liquid, gas), relative density, solubility in water, and the ability to conduct or insulate.



### Distractor Factor

Teachers should dispel the idea that gases are not matter because they cannot always be seen and their mass cannot easily be measured.

Teachers should explain that when a substance dissolves into a liquid it is still present and has not disappeared. Teachers should regularly differentiate between mass, capacity, and volume. Teachers should dispel the idea that heavier objects sink while lighter objects float.



### Level of Difficulty (based on local data)

- Moderate  Challenging

**(5.6) Force, motion, and energy.** The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to

**(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy;**



### Content Builder

**What do the students need to know?**

#### Content

- Mechanical
- Light
- Thermal (heat)
- Electrical
- Sound

#### Connections

This student expectation has been building over the past two years. In grade 03, students explored different forms of energy including mechanical, light, sound, and heat/thermal within the context of everyday life. In grade 04, students differentiated between the forms of energy they studied in grade 03. This builds their knowledge and skills so that they may explore the uses of energy in grade 05.

#### To what degree will this learning impact learning two years down the road?

In grade 06, students will focus on mechanical energy and the differences between potential and kinetic energy. In grade 07, students will recognize and work with the relationships between force, motion, and energy.



### Academic Vocabulary

- Energy
- Mechanical energy
- Light energy
- Sound energy
- Heat/thermal energy



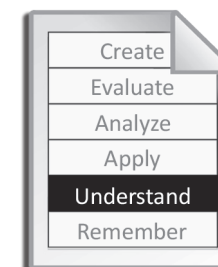
### Rigor Implications

#### Verb

- Explore

#### Level of Bloom's Taxonomy

- Understanding



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to explore how energy travels, flows, and is transformed, and how this allows each type of energy to be useful.



### Distractor Factor

When studying light energy, teachers should regularly differentiate between reflection and refraction.

When studying light energy, teachers should dispel the idea that only shiny objects can reflect light.



### Level of Difficulty (based on local data)

- Moderate       Challenging

**(5.6) Force, motion, and energy.** The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to

**(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound;**



### Content Builder

**What do the students need to know?**

#### Content

- The flow of electricity requires a complete path through which an electric current can pass
- Electricity can produce light
- Electricity can produce heat
- Electricity can produce sound

#### Connections

Grade 04 is the first formal introduction to the flow of electricity. Students demonstrated that electricity travels in a closed path creating an electrical circuit. This prepares students for grade 05, where they will demonstrate that the flow of electricity in circuits requires a complete path through which an electrical current can pass, and this can produce light, heat, and sound.

**To what degree will this learning impact learning two years down the road?**

This is the last time students will be formally investigating the flow of electricity.



### Academic Vocabulary

- Energy
- Flow
- Circuit
- Closed circuit
- Open circuit
- Current



### Rigor Implications

#### Verb

- Demonstrate

#### Level of Bloom's Taxonomy

- Applying



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity show evidence that the flow of electricity requires a complete path through which an electrical current can pass.



### Distractor Factor

Teachers should ensure that students are not misled by the word “produced” in the standard. The electrical energy that flows is a transformation of chemical energy from the cell. Students may have the misconception that energy is made and used, when in fact it is transformed.



### Level of Difficulty (based on local data)

- Moderate  Challenging

## Grade 5 Science

**(5.6) Force, motion, and energy.** The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to

**(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water;**



### Content Builder

**What do the students need to know?**

#### Content

- Light travels in a straight line until:
  - It strikes an object
  - Travels through one medium to another
- Light can be reflected
  - Mirrors
  - Shiny surfaces
- Light can be refracted
  - The appearance of an object when observed through water

#### Connections

This is the first time that students are formally introduced to the manner in which light travels and behaves.

#### To what degree will this learning impact learning two years down the road?

This is the last time students will be formally investigating the movement of light in depth until grade 08.



### Academic Vocabulary

- Reflection
- Refraction
- Concave
- Convex



### Rigor Implications

#### Verb

- Demonstrate

#### Level of Bloom's Taxonomy

- Applying



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to demonstrate how light travels and how it can be reflected and refracted.



### Distractor Factor

Teachers should dispel the idea that only shiny objects reflect light.

Teachers should regularly differentiate between convex and concave.



### Level of Difficulty (based on local data)

- Moderate       Challenging

**(5.7) Earth and space.** The student knows Earth’s surface is constantly changing and consists of useful resources. The student is expected to

## Grade 5 Science

**(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels;**



### Content Builder

**What do the students need to know?**

#### Content

- Processes leading to
  - Formation of sedimentary rocks
  - Fossil fuels

#### Connections

Students have been studying weathering and erosion during the previous two years. In grade 03, students explored and recorded how soils are formed, including the processes of weathering and decomposition of plant and animal remains. This was a precursor to what students will be investigating in grade 05 as they explore the processes that led to the formation of sedimentary rocks and fossil fuels.

#### To what degree will this learning impact learning two years down the road?

This standard is students’ first introduction to sedimentary rock formation. Students will use this information in grade 06 in order to classify rocks as igneous, metamorphic, or sedimentary.



### Academic Vocabulary

- Sedimentary
- Fossil fuel
- Weathering
- Erosion
- Compaction
- Cementation
- Decomposition



### Rigor Implications

#### Verb

- Explore

#### Level of Bloom’s Taxonomy

- Understanding



#### Instructional Implications

To appropriately adhere to the standard, students should be provided opportunities to explore the processes that led to the formation of sedimentary rocks and fossil fuels using models. It would be valuable to discuss the limitations of models.



### Distractor Factor

Teachers should dispel the idea that oil is formed in empty spaces deep in the Earth.

Teachers should ensure that students understand that sedimentary rock layers are not always found as perfectly flat layers.



### Level of Difficulty (based on local data)

- Moderate                       Challenging



**(5.7) Earth and space.** The student knows Earth’s surface is constantly changing and consists of useful resources. The student is expected to

## Grade 5 Science

**(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth’s surface by wind, water, and ice;**



### Content Builder

**What do the students need to know?**

#### Content

- Deltas, canyons, and sand dunes are the result of changes to Earth’s surface by
  - Wind
  - Water
  - Ice

#### Connections

In grade 03, students investigated rapid changes in the Earth’s surface such as volcanic eruptions, earthquakes, and landslides. In grade 04, students observed and identified slow changes to the Earth’s surface caused by weathering, erosion, and deposition from water, wind, and ice. The previous investigations of these change agents will support students’ ability to recognize how specific landforms were created.

**To what degree will this learning impact learning two years down the road?**

Students will further study changes to the Earth’s surface in grade 06 as they describe how plate tectonics cause major geological events.



### Academic Vocabulary

- Delta
- Canyon
- Sand dune
- Wind
- Water
- Ice
- Erosion
- Weathering
- Deposition



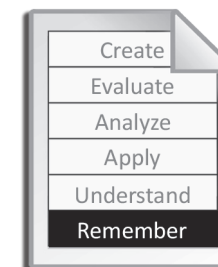
### Rigor Implications

#### Verb

- Recognize

#### Level of Bloom’s Taxonomy

- Remembering



#### Instructional Implications

To appropriately adhere to the standard, students should be provided opportunities to use their prior knowledge of changes to the Earth’s surface to match the cause (weathering, erosion, deposition, etc.) to the landforms that they create.



### Distractor Factor

Teachers should stress the effect that water has on Earth’s surface.

Teachers should regularly differentiate between weathering and erosion.



### Level of Difficulty (based on local data)

- Moderate       Challenging

**(5.7) Earth and space.** The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to

## Grade 5 Science

**(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels;**



### Content Builder

**What do the students need to know?**

#### Content

- Alternative energy resources
  - Wind
  - Solar
  - Hydroelectric
  - Geothermal
  - Biofuels

#### Connections

In grade 04, students identified and classified the Earth's renewable resources (including air, plants, water, and animals), nonrenewable resources (including coal, oil, and natural gas), and the importance of conservation. In grade 05, students will use their knowledge of resources to identify alternative energy resources.

#### To what degree will this learning impact learning two years down the road?

This is the last time students will formally study alternative energy resources.



### Academic Vocabulary

- Alternative energy
- Hydroelectric
- Geothermal
- Biofuel



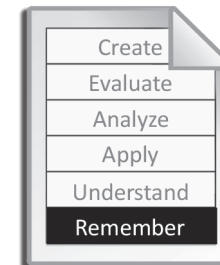
### Rigor Implications

#### Verb

- Identify

#### Level of Bloom's Taxonomy

- Remembering



#### Instructional Implications

Students should be provided the opportunity to do research on a variety of alternative energy resources currently being harnessed in the US and their long-term benefits. They may create a brochure or poster that they could share with other students.



### Distractor Factor

Teachers should stress that alternative energy resources are intended to harness energy which has a less damaging impact on the environment.



### Level of Difficulty (based on local data)

- Moderate       Challenging

**(5.8) Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

**(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky;**



### Content Builder

**What do the students need to know?**

#### Content

- Earth rotates on its axis approximately every 24 hours causing
  - Day/night cycle
  - The apparent movement of the Sun across the sky

#### Connections

In grade 03, students constructed models that demonstrated the relationship of the Sun, Earth, and Moon, including orbits and positions. In grade 04, students collected and analyzed data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time. These concepts prepared students to demonstrate that the Earth rotates on its axis.

#### To what degree will this learning impact learning two years down the road?

Understanding the result of the Earth's rotation on its axis will support students in grade 06, when they will be describing the physical properties, locations, and movements of the Sun, planets, Galilean moons, meteors, asteroids, and comets.



### Academic Vocabulary

- Rotate
- Axis



### Rigor Implications

#### Verb

- Demonstrate

#### Level of Bloom's Taxonomy

- Applying



#### Instructional Implications

To appropriately adhere to the standard students should be provided the opportunities explore and then demonstrate the result of the rotation of the Earth on its axis using models as required by standard 5.3C. It will be significant to discuss with students the limitations of models.



### Distractor Factor

Teachers should emphasize that the Sun does not truly rise or set.



### Level of Difficulty (based on local data)

- Moderate       Challenging

**(5.9) Organisms and environments.** The student knows that there are relationships, systems, and cycles within environments. The student is expected to

## Grade 5 Science

**(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements;**



### Content Builder

**What do the students need to know?**

#### Content

- The way organisms live and survive in their ecosystem by
  - Interacting with the living elements
  - Interacting with the non-living elements

#### Connections

In grades 03 and 04, students observed and described the physical characteristics of environments, including the roles of producers and consumers. This will support students in making observations about the way organisms live and survive in their environments.

**To what degree will this learning impact learning two years down the road?**

This standard will support students in grade 06, when they will be diagramming the levels of organization within an ecosystem.



### Academic Vocabulary

- Ecosystem
- Living
- Non-living



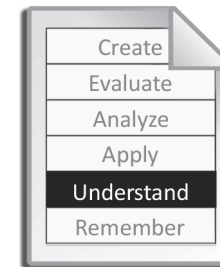
### Rigor Implications

#### Verb

- Observe

#### Level of Bloom's Taxonomy

- Understanding



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to observe actual habitats such as aquariums or terrariums as required by standard 5.4A.



### Distractor Factor

Teachers should stress the significance of non-living elements within an ecosystem.



### Level of Difficulty (based on local data)

- Moderate  Challenging

**(5.9) Organisms and environments.** The student knows that there are relationships, systems, and cycles within environments. The student is expected to

## Grade 5 Science

**(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers;**



### Content Builder

**What do the students need to know?**

#### Content

- Flow of energy derived from the Sun is
  - Used by producers to create their own food
  - Transferred through a food chain and food web
    - To consumers
    - To producers

#### Connections

In grade 03, students identified and described the flow of energy in a food chain and predicted how changes in the ecosystem affect the food chain. In grade 04, students described the flow of energy through a food web beginning with the Sun. The student expectation at grade 05 is a reinforcement of these previously addressed standards with the addition of decomposers.

#### To what degree will this learning impact learning two years down the road?

This standard will support students in grade 06, when students will be diagramming the levels of organization within an ecosystem.



### Academic Vocabulary

- Energy
- Food chain
- Food web
- Consumer
- Producer
- Decomposer



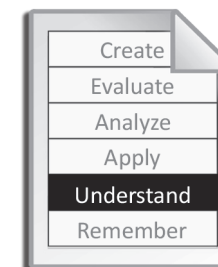
### Rigor Implications

#### Verb

- Describe

#### Level of Bloom's Taxonomy

- Understanding



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to describe how the flow of energy derived from the Sun and used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers orally, in writing, or with illustrations. Students may complete this task by illustrating the flow of energy and including a description for each step of the process.



### Distractor Factor

Teachers should distinguish between a food web and a food chain.



### Level of Difficulty (based on local data)

- Moderate       Challenging

**(5.10) Organisms and environments.** The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to

**(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals;**



### Content Builder

**What do the students need to know?**

#### Content

- Structures and functions of different species that help them live and survive
  - Hooves
  - Webbed feet

#### Connections

In grade 03, students explored how structures and functions of plants and animals allow them to survive in a particular environment. Grade 04 extended the exploration to the way in which adaptations enable organisms to survive in their environment, such as comparing birds' beaks and leaves on plants. This will help students in grade 06 as they compare the structures and functions of different species and how this helps them to survive.

#### To what degree will this learning impact learning two years down the road?

In grade 06, students will be looking at taxonomic classification where the recognition of an organism's structures and functions will be necessary. As students move into grade 07, they will be looking at structure and function at the cellular level.



### Academic Vocabulary

- Structure
- Function



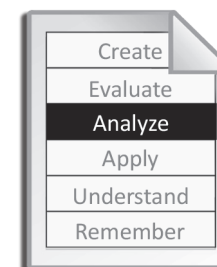
### Rigor Implications

#### Verb

- Compare

#### Level of Bloom's Taxonomy

- Analyzing



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to compare a variety of structures and functions of different species. These comparisons may be done orally, in writing, or through illustrations.



### Distractor Factor

Teachers should not limit instruction to hooves and webbed feet.



### Level of Difficulty (based on local data)

- Moderate  Challenging



## Grade 5 Science

**(5.10) Organisms and environments.** The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to

**(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle; and**



### Content Builder

**What do the students need to know?**

#### Content

- Inherited traits
  - Plants
    - Spines on a cactus
  - Animals
    - Shape of a beak
- Learned behaviors
  - An animal learning tricks
  - A child riding a bicycle

#### Connections

In grade 03, students explored characteristics that are inherited and behaviors that are learned in response to living in a certain environment. In grade 04, students demonstrated that some characteristics are inherited while behaviors are learned. This supports the grade 05 standard which will have students differentiating between inherited traits and learned behaviors.

#### To what degree will this learning impact learning two years down the road?

In grade 07, students will be studying genetics, where they will be asked to recognize that inherited traits of individuals are governed by the genetic material found in the genes within the chromosomes in the nucleus.



### Academic Vocabulary

- Inherited trait
- Learned behavior



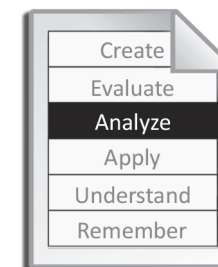
### Rigor Implications

#### Verb

- Differentiate

#### Level of Bloom's Taxonomy

- Analyzing



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to distinguish between inherited traits and learned behaviors.



### Distractor Factor

Teachers should not limit instruction to spines on cactus, shapes of beaks, animals learning tricks, and a child riding a bike.



### Level of Difficulty (based on local data)

- Moderate       Challenging

**(5.5) Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

**(B) identify the boiling and freezing/melting points of water on the Celsius scale**



### Supporting the Readiness Standards

#### What Readiness Standard(s) or concepts from the Readiness Standards does it support?

5.5A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

#### How does it support the Readiness Standard(s)?

This standard supports 5.5A as a measurable physical property that can be used to determine how matter is classified, changed, and used.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Boiling point
- Melting point
- Celsius Scale



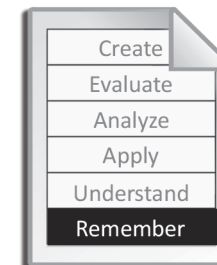
### Rigor Implications

#### Verb

- Identify

#### Level of Bloom's Taxonomy

- Remembering



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to identify the boiling, melting, and freezing points of water on the Celsius scale. After formal instruction, students should be able to match the 0°C, 100°C with freezing/melting and boiling points of water respectively.

**(5.5) Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

**(C) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.5A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

**How does it support the Readiness Standard(s)?**

This standard supports 5.5A as important information to allow students to differentiate between mixtures and solutions.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Physical property
- Mixture



### Rigor Implications

**Verb**

- Demonstrate

**Level of Bloom's Taxonomy**

- Applying



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to work with a variety of mixtures to determine which mixtures maintain the physical properties of their ingredients.

**(5.5) Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

**(D) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.5A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

**How does it support the Readiness Standard(s)?**

This standard supports 5.5A as the physical property of solubility in water that can be used to determine how matter is classified, changed, and used.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Physical property
- Solution
- Dissolve



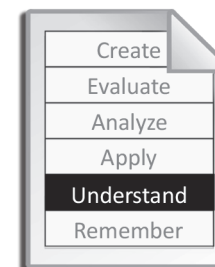
### Rigor Implications

**Verb**

- Identify

**Level of Bloom's Taxonomy**

- Understanding



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to work with a variety of solutions including, but not limited to, water + salt and water + lemon juice to identify the changes that occur in the physical properties of these solutions.

**(5.6) Force, motion, and energy.** The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to

**(D) design an experiment that tests the effect of force on an object**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

8.6A demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion

**How does it support the Readiness Standard(s)?**

This standard supports 8.6A by providing the foundational exploration of the effects of force on an object, which will eventually lead to the study of unbalanced forces, speed, and motion.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Experiment
- Force



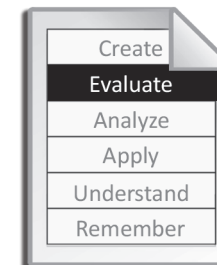
### Rigor Implications

**Verb**

- Design

**Level of Bloom's Taxonomy**

- Evaluating



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to independently design an experiment that tests the effects of force (including but not limited to push, pull, and friction) on an object.

**(5.7) Earth and space.** The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to

## Grade 5 Science

**(D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.7A explore the processes that led to the formation of sedimentary rocks and fossil fuels.

**How does it support the Readiness Standard(s)?**

This standard supports 5.7A indirectly by approaching the processes from the opposite perspective. This standard is looking at what is left (fossils) to determine which processes occurred.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Fossil
- Model



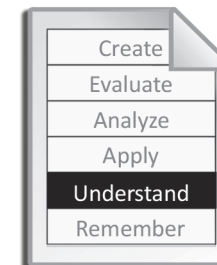
### Rigor Implications

**Verb**

- Identify

**Level of Bloom's Taxonomy**

- Understanding



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to observe and create models which will allow them to identify that fossils are evidence of past living organisms and the nature of the environments.



**(5.8) Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

### (A) differentiate between weather and climate



#### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

N/A

**How does it support the Readiness Standard(s)?**

*May be adjusted according to local curriculum.*



#### Academic Vocabulary

- Weather
- Climate



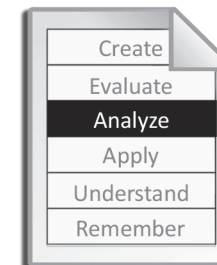
#### Rigor Implications

**Verb**

- Differentiate

**Level of Bloom's Taxonomy**

- Analyzing



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to explore the aspects of weather and climate independently as recognizable patterns in the natural world, so that they may then differentiate between the two.

**(5.8) Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

**(B) explain how the Sun and the ocean interact in the water cycle**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

N/A

**How does it support the Readiness Standard(s)?**

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Water cycle
- Evaporation
- Condensation
- Precipitation
- Collection



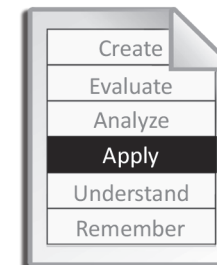
### Rigor Implications

**Verb**

- Explain

**Level of Bloom's Taxonomy**

- Applying



### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to explain orally, in writing, or through illustration, how the Sun and ocean interact in the water cycle.

**(5.8) Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

**(D) identify and compare the physical characteristics of the Sun, Earth, and Moon.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

8.7A model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons.

8.7B demonstrate and predict the sequence of events in the lunar cycle.

**How does it support the Readiness Standard(s)?**

This standard supports 8.7A and 8.7B by providing students with the characteristics of the Sun, Earth and Moon which will allow them to better appreciate the relationship between them.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Physical characteristic
- Axial tilt
- Atmosphere
- Layers
- Craters
- Mountains
- Plains
- Soil
- Rock



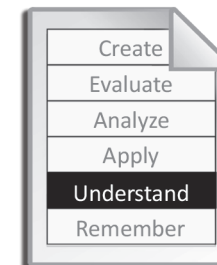
### Rigor Implications

**Verb**

- Identify

**Level of Bloom's Taxonomy**

- Understanding



### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to explore the physical characteristics of the Sun, Earth, and Moon independently so that they may accurately identify and compare the physical characteristics of each. This should include temperature, make up (atmosphere, gases, water, etc.), and landforms.

**(5.9) Organisms and environments.** The student knows that there are relationships, systems, and cycles within environments. The student is expected to

**(C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.9A observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements.

**How does it support the Readiness Standard(s)?**

This standard supports 5.9A indirectly by describing a specific situation that will affect the way organisms live and survive within their ecosystem.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Ecosystem
- Consumer
- Producer
- Predator
- Prey
- Overpopulation
- Competition



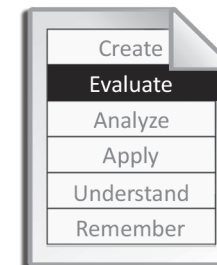
### Rigor Implications

**Verb**

- Predict

**Level of Bloom's Taxonomy**

- Evaluating



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to explore a variety of interactions that occur between living organisms within an ecosystem in order to make predictions (orally, written, or through illustrations) about the changes that may affect the ecosystem. This is a very difficult standard to demonstrate. There are many websites that simulate outcomes when there are changes to the population. Students may also play a version of tag where one set of students are labeled the predator and the other the prey. Manipulating the number of students on either side (predator or prey) would demonstrate the basics of the standard.

**(5.9) Organisms and environments.** The student knows that there are relationships, systems, and cycles within environments. The student is expected to

## Grade 5 Science

**(D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.9B describe the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers.

**How does it support the Readiness Standard(s)?**

This standard fully supports 5.9B as significant components of photosynthesis that describe how the energy derived from the Sun is used by producers to create their own food.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Respiration
- Carbon dioxide
- Oxygen
- Photosynthesis



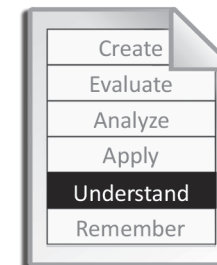
### Rigor Implications

**Verb**

- Identify

**Level of Bloom's Taxonomy**

- Understanding



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to investigate the carbon-dioxide cycle in order to identify its significance in the survival of plants and animals. This includes allowing students to make predictions about what would happen in an established ecosystem if the parts of the ecosystem that provide carbon dioxide are removed.

**(5.10) Organisms and environments.** The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to

**(C) describe the differences between complete and incomplete metamorphosis of insects.**



**Supporting the Readiness Standards**

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

N/A

**How does it support the Readiness Standard(s)?**

Complete and incomplete metamorphoses are characteristics of organisms that can be used for taxonomic classification.

*May be adjusted according to local curriculum.*



**Academic Vocabulary**

- Egg
- Larva
- Pupa
- Adult
- Nymph



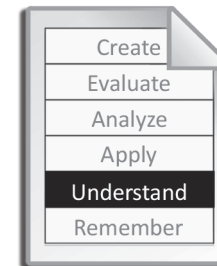
**Rigor Implications**

**Verb**

- Describe

**Level of Bloom's Taxonomy**

- Understanding



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to investigate the stages of complete and incomplete metamorphosis of insects in order to describe (orally, written, or illustrated) the differences between them. Students should be able to complete a Venn Diagram of the stages that complete and incomplete metamorphosis share, and those that are unique to each of them.

**(3.5) Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

**(C) predict, observe, and record changes in the state of matter caused by heating or cooling.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

3.5A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electrical energy.

**How does it support the Readiness Standard(s)?**

This standard indirectly supports 3.5A, as it will impact the physical state of matter.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Solid
- Liquid
- Gas
- Melting
- Freezing



### Rigor Implications

**Verb**

- Predict
- Observe
- Record

**Level of Bloom's Taxonomy**

- Evaluating
- Understanding
- Applying



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to physically observe matter being heated or cooled in order to predict and record the changes that occur. This includes predicting what would happen to an ice cube that was placed in a bowl of hot soup (the transfer of heat from the hot soup to the cold ice). It should also include heating and cooling matter other than water.

**(3.6) Force, motion, and energy.** The student knows that forces cause change and that energy exists in many forms. The student is expected to

**(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.6A explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy.

**How does it support the Readiness Standard(s)?**

This standard supports 5.6A by providing important information about mechanical energy, which will allow students to further explore how it can be used.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Position
- Motion
- Work



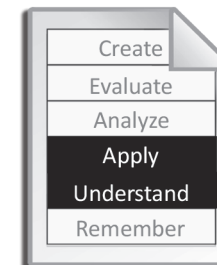
### Rigor Implications

**Verb**

- Demonstrate
- Observe

**Level of Bloom's Taxonomy**

- Applying
- Understanding



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to push and pull swings, balls, pulleys, wagons and other objects to demonstrate and observe how the pushing and pulling cause changes in position and motion. The motions should include speeding up, slowing down, and changing direction. Instruction should also include the idea that forces can cause motion, stop motion, or change its direction.



**(3.7) Earth and space.** The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to

## Grade 5 Science

**(B) investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.7B recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to the Earth's surface by wind, water, and ice.

**How does it support the Readiness Standard(s)?**

This standard supports 5.7B by providing additional information related to how landforms are created, this time through rapid changes in the Earth's surface.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Volcanic eruption
- Earthquake
- Tsunami
- Landslide
- Hurricane
- Tornado



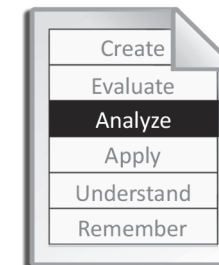
### Rigor Implications

**Verb**

- Investigate

**Level of Bloom's Taxonomy**

- Analyzing



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to investigate rapid changes in the Earth's surface using pictures, books, and technology. Students may also use models to investigate rapid changes. The teacher should include a discussion on the limitations of models.

**(3.8) Earth and space.** The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to

**(D) identify the planets in Earth’s solar system and their position in relation to the Sun.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.8C demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky.

**How does it support the Readiness Standard(s)?**

This standard supports 5.8C with important information about the planets in Earth’s solar system and their position in relation to the sun, which may not necessarily be required for the body of knowledge of the readiness standard.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Mercury
- Venus
- Earth
- Mars
- Jupiter
- Saturn
- Uranus
- Neptune



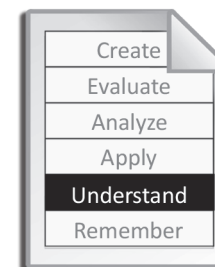
### Rigor Implications

**Verb**

- Identify

**Level of Bloom’s Taxonomy**

- Understanding



**Instructional Implications**

To appropriately adhere to the standard, students should be provided information about and models of Earth’s solar system, in order to identify the planets and their position in relation to the Sun.

**(3.9) Organisms and environments.** The student knows that organisms have characteristics that help them survive and can describe patterns, cycles, systems, and relationships within the environments. The student is expected to

**(A) observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.9A observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements.

**How does it support the Readiness Standard(s)?**

This standard directly supports 5.9A by having students focus on the physical characteristics of environments that will impact how organisms live and survive within an ecosystem.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Species
- Populations
- Communities
- Food webs
- Disturbance
- Ecosystem
- Diversity



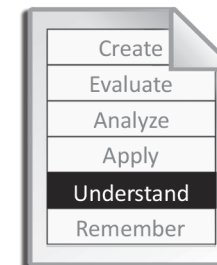
### Rigor Implications

**Verb**

- Observe
- Describe

**Level of Bloom's Taxonomy**

- Understanding



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to use materials to support observations of organisms (such as terrariums and aquariums) as outlined in standard 3.4A.

**(3.10) Organisms and environments.** The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to

**(C) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs.**



**Supporting the Readiness Standards**

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.9A observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements.

**How does it support the Readiness Standard(s)?**

This standard supports 5.9A indirectly as a way in which organisms live. It is connected directly to the KS 5.9 which states that the student knows that there are relationships, systems, and cycles within environments.

*May be adjusted according to local curriculum.*



**Academic Vocabulary**

- Life cycle
- Seed
- Seedling
- Plant
- Fruit
- Egg
- Embryo
- Tadpole
- Frog
- Larva
- Pupa
- Adult



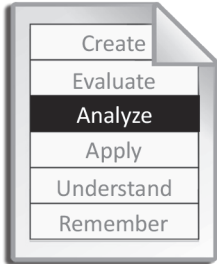
**Rigor Implications**

**Verb**

- Investigate
- Compare

**Level of Bloom’s Taxonomy**

- Analyzing



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to investigate by observing the series of orderly changes that animals and plants undergo in order to compare them (orally, written, illustrated) to one another. This includes seed, seedling, plant, and fruit for plants. It includes egg, embryo, tadpole, frog, larva, pupa, and adult for animals.

**(4.7) Earth and space.** The student knows that Earth consists of useful resources and its surface is constantly changing. The student is expected to

## Grade 5 Science

**(A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants**



### Supporting the Readiness Standards

#### What Readiness Standard(s) or concepts from the Readiness Standards does it support?

This standard does not directly support a readiness student expectation but does support knowledge and skill statement 5.7.

#### How does it support the Readiness Standard(s)?

This standard supports KS 5.7 which states that the student knows Earth's surface is constantly changing and consists of useful resources.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Soil
- Color
- Texture



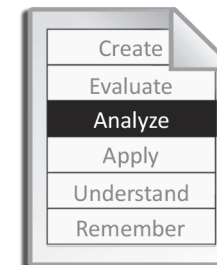
### Rigor Implications

#### Verb

- Examine

#### Level of Bloom's Taxonomy

- Analyzing



#### Instructional Implications

To appropriately adhere to the standard students should be provided the opportunity to physically examine and test the properties of soils, including color, texture, capacity to retain water, and capacity to support the growth of life.

**(4.7) Earth and space.** The student knows that Earth consists of useful resources and its surface is constantly changing. The student is expected to

**(C) identify and classify Earth’s renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

5.7C identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels.

**How does it support the Readiness Standard(s)?**

This standard supports 5.7C by stressing the importance of conservation which can lead to the significance of harnessing alternative energy resources.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Renewable
- Non-renewable
- Conservation



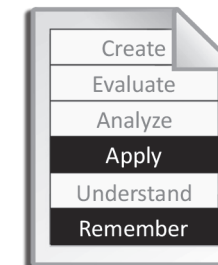
### Rigor Implications

**Verb**

- Identify
- Classify

**Level of Bloom’s Taxonomy**

- Remembering
- Analyzing



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to explore renewable and non-renewable resources in order to identify resources and classify them as either renewable or non-renewable. The teacher should stress the importance of conservation.

**(4.8) Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

**(A) measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key;**



### Supporting the Readiness Standards

#### What Readiness Standard(s) or concepts from the Readiness Standards does it support?

This standard does not directly support a readiness standard, but does support knowledge and skill statement 5.7.

#### How does it support the Readiness Standard(s)?

This standard supports KS 5.7, which states that the student knows Earth's surface is constantly changing and consists of useful resources. Weather plays a direct role in the changing of the Earth's surface.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Low pressure
- High pressure
- Warm front
- Cold front
- Thunderstorm
- Hurricane
- Tornado
- Haze
- Fog
- Rain
- Freezing rain
- Wind



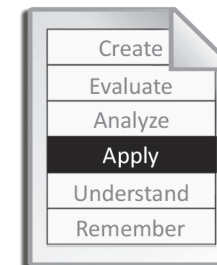
### Rigor Implications

#### Verb

- Measure
- Record

#### Level of Bloom's Taxonomy

- Applying



#### Instructional Implications

To appropriately adhere to the standard, students should be provided the opportunity to observe weather daily, measure temperature and precipitation, and record the changes. Students should also become familiar with weather maps, weather symbols, and weather keys in order to use weather maps to make predictions. Students should be able to record their observations of the weather over 3 days, and create a weather map to accurately represent those observations.

**(4.8) Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

**(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

N/A

**How does it support the Readiness Standard(s)?**

Although this standard does not directly support a readiness standard it does support the grade 05 supporting standard 5.8B, as students will be required to explain how the Sun and the ocean interact in the water cycle.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Precipitation
- Condensation
- Collection
- Absorbed
- Evaporation



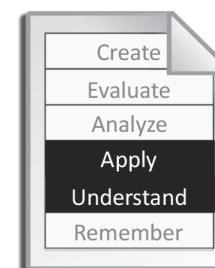
### Rigor Implications

**Verb**

- Describe
- Illustrate

**Level of Bloom's Taxonomy**

- Understanding
- Applying



**Instructional Implications**

To appropriately adhere to the standard, students should be provided the opportunity to describe (orally or in writing) and illustrate the movement of water through the water cycle with an emphasis on the role of the Sun.



**(4.8) Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

**(C) collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time.**



### Supporting the Readiness Standards

**What Readiness Standard(s) or concepts from the Readiness Standards does it support?**

N/A

**How does it support the Readiness Standard(s)?**

Although this does not directly support a readiness standard, it does support the grade 05 supporting standard 5.8D, by providing students with information about the Moon, Earth, and Sun, which will support students in identifying and comparing their characteristics.

*May be adjusted according to local curriculum.*



### Academic Vocabulary

- Waxing
- Waning
- Gibbous
- Crescent
- Full moon
- New moon
- Quarter moon
- Ebb
- Flow
- Gravity
- Fall
- Spring
- Summer
- Winter



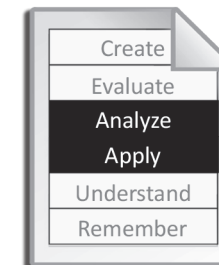
### Rigor Implications

**Verb**

- Collect
- Analyze

**Level of Bloom's Taxonomy**

- Applying
- Analyzing



**Instructional Implications**

Students should be able to collect a series of data, including phases of the moon, shadows, tides, and seasons, analyze it, and use the information to make predictions about what will happen next. Students should then be able to sequence a set of cards with a series of data based on previously analyzed patterns.