

Entry Points – Grade 5

Science

CONTENT Science
STRAND Science and Technology

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Science and Technology	5.1.1	Evaluate the validity of claims based on the amount and quality of the evidence cited.	♦ Judge the validity of claims based on the amount and quality of the evidence from an investigation
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Science and Tech.	<ul style="list-style-type: none"> ♦ Name and sequence the steps of an investigation ♦ Based on an investigation sort valid and invalid claims 	<ul style="list-style-type: none"> ♦ Define validity, evidence, and quality as scientific terms ♦ Use data presented in an investigation to support scientific outcomes ♦ Use charts, tables, or graphic organizers to show data from a scientific investigation 	<ul style="list-style-type: none"> ♦ Evaluate the design of an experiment based on amount and quality of evidence ♦ Analyze the data presented in the investigation to determine whether claims are valid

CONTENT Science

STRAND Science and Technology

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Science and Technology	5.2.1	Recognize and describe how results of similar scientific investigations may turn out differently because of inconsistencies in methods, materials, and observations, or because of limitations of the precision of the instruments used.	<ul style="list-style-type: none"> ◆ Analyze how inconsistencies and limitations of investigations affect the results
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Science and Technology	<ul style="list-style-type: none"> ◆ List the different steps in the scientific method ◆ Define scientific investigation 	<ul style="list-style-type: none"> ◆ Sequence the scientific method for simple investigation ◆ Define the meaning of consistencies and inconsistencies and limitations ◆ Record the step by step instructions when performing new investigation including outcomes and predictions 	<ul style="list-style-type: none"> ◆ Use the scientific method to complete a simple investigation and explain limitations ◆ Explain how to avoid inconsistencies or limitations in a simple investigation

CONTENT Science

STRAND Science and Technology

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Science and Technology	5.2.5	Identify the controlled variable and at least one independent variable in a scientific investigation, when appropriate.	<ul style="list-style-type: none"> ◆ Identify controlled and independent variables in an experiment
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Science and Technology	<ul style="list-style-type: none"> ◆ Identify things that can control the outcome of an investigation ◆ Identify things that can change the outcome of an investigation 	<ul style="list-style-type: none"> ◆ Define scientific variable ◆ Recognize if a scientific investigation is using a controlled variable or an independent variable (e.g., a plant with sunlight verses a plant without sunlight) ◆ Define independent and controlled variables 	<ul style="list-style-type: none"> ◆ Locate controlled variables and independent variables in a scientific investigation ◆ Locate examples of independent and controlled variables

CONTENT Science

STRAND Earth and Space Science

Grade 5				
Learning Standards as written			Essential and Prioritized Skill	
Earth Science	5.5.1	Describe the Earth as part of a system called the solar system, which includes the sun (a star), planets, comets, asteroids, and many moons.	♦ Explain what a solar system is and how the earth fits into it (the Earth as part of a system called the Solar System)	
Less Complex		Possible Entry Points		More Complex
<u>The student will:</u>		<u>The student will:</u>		<u>The student will:</u>
Earth and Space Science	<ul style="list-style-type: none"> ♦ Identify the sun (a star), planets, comets, asteroids, or moons (e.g., use flash- card, manipulatives) ♦ Name and describe the largest body in the solar system ♦ Represent in diagram the solar system 	<ul style="list-style-type: none"> ♦ Sequence the Earth and planets in ordinal pattern in the solar system ♦ List the distance of the planets from the earth. ♦ Compare the features of the Earth to the features of other planets ♦ Distinguish among the sun (a star), planets, comets, asteroids, or moons (e.g., use flashcards, manipulatives) 	<ul style="list-style-type: none"> ♦ Describe the order of the planets according to their distance from the sun (e.g., using different size ball or NASA pictures) ♦ Describe the properties of a planet (e.g., explain why Pluto is not a planet) ♦ Describe the properties of a solar system (e.g., explain why Pluto is a part of the solar system) 	

CONTENT Science

STRAND Earth and Space Science

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Earth Science	5.5.3	Demonstrate how the Earth orbits the sun in a year's time and Earth rotates on its axis about once every 24 hours.	◆ Demonstrate how the Earth orbits and rotates
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Earth and Space Science	<ul style="list-style-type: none"> ◆ Identify the moon, sun, and the Earth ◆ Describe day and night (e.g., using pictures and other materials) ◆ List the seasons 	<ul style="list-style-type: none"> ◆ Distinguish day from night ◆ Differentiate the seasons ◆ Represent in a diagram day and night (e.g., pictures, drawings) ◆ Represent in diagrams the seasons ◆ Compare the Earth and the sun or the Earth and the moon ◆ Using a picture/model, construct a model illustrating how the Earth orbits and rotates 	<ul style="list-style-type: none"> ◆ Construct a model from memory illustrating how the Earth orbits and rotates ◆ Explain how the Earth's rotation affects the time or seasons ◆ Cite evidence that the Earth's rotation affects the time or season ◆ Design how the Earth's rotation causes day and night ◆ Design how the sun's rays strike the Earth to cause seasons

CONTENT Science

STRAND Life Science

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Life Science	5.12.2	Identify organisms that are not native to the Washington, DC, area and how they undergo changes to increase their chance of survival in the area.	◆ Identify non-native organisms and explain how they adapt to Washington, DC
Less Complex		Possible Entry Points	More Complex
	<u>The student will:</u>	<u>The student will:</u>	<u>The student will:</u>
Life Science	<ul style="list-style-type: none"> ◆ Define/illustrate “adaptation” ◆ Classify organisms as native or non-native to Washington, DC 	<ul style="list-style-type: none"> ◆ Identify different samples of organisms not native to Washington, DC (e.g., snake fish) ◆ Identify ways that organisms not native to Washington, DC affect our environment ◆ Complete sentences or picture graphics telling how non-native organisms maintained their chance of survival in the Washington, DC area 	<ul style="list-style-type: none"> ◆ Describe how organisms not native to Washington, DC change ◆ Classify types of organisms which are likely to survive in a particular environment ◆ Match non-native organisms to the way they changed to survive in Washington, DC ◆ Use a Venn Diagram to compare native and non-native organisms

General Education Examples: Student compares and contrasts at least three native and three **non-native** plants. The diagram shows at least five similarities and differences (e.g., size, shape, competition or cooperation with other species, possibilities for extinction, water and nutrition sources, human uses, etc.)

Student creates a one minute informational TV advertisement about **non-native** plants and their effect on the native environment. The ad must address at least three ways that the **non-native** plants effect the native environment

CONTENT Science

STRAND Life Science

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Life Science	5.12.4	Explain that organisms fit enough to survive in a particular environment will typically produce offspring fit enough to survive and reproduce in that particular environment. Over time, these inherited characteristics are carried as the predominant forms (e.g., adaptations such as shape of beak, length of neck, shape of teeth).	<ul style="list-style-type: none"> ◆ Explain survival and inherited characteristics
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Life Science	<ul style="list-style-type: none"> ◆ Define organisms ◆ Identify characteristics of living things ◆ Group organisms into categories using their characteristics (e.g., living things, plants and animals) 	<ul style="list-style-type: none"> ◆ Match an organism’s survival characteristic to its environment (e.g., giraffe’s long neck— Sahara where leaves are only high up) ◆ Identify characteristics that can be inherited (e.g., eye color, height, shape of beak, etc.) ◆ Match an organism to its habitat 	<ul style="list-style-type: none"> ◆ Describe the survival needs of different organisms based on their environments ◆ Compare and contrast the differing ways an organism interacts with its surroundings (e.g., how a frog and a butterfly get food, protect themselves, etc.) ◆ Explain how different organisms use their unique adaptations to meet their needs

CONTENT Science

STRAND Life Science

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Life Science	5.12.5	Explain how changes in an organism’s habitat are sometimes beneficial and sometimes harmful, and how changes in the environment (drought, cold) have caused some plants and animals to die, migrate, or become extinct.	♦ Explain effects of habitat change
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Life Science	<ul style="list-style-type: none"> ♦ Describe habitat ♦ Define environment ♦ Identify different environments 	<ul style="list-style-type: none"> ♦ Explain how animals and plants use resources in their environments ♦ List examples of how habitat can be affected by the weather ♦ Describe major dry-land environments (e.g., plants and animals that live in the desert, rainforest, arctic, etc.) 	<ul style="list-style-type: none"> ♦ Match a habitat change with an outcome (or likely outcome) for particular plants and animals (e.g., using objects, pictures, or symbols) ♦ Describe the effects of flood, disease and erosion on organisms and habitat

CONTENT Science

STRAND Life Science

Grade 5			
Learning Standards as written			Essential and Prioritized Skill
Life Science	5.12.9	Examine the information that fossils provide us about living things that inhabited the Earth in the distant past, and describe how they can be compared both with one another and with living organisms according to their similarities and differences.	<ul style="list-style-type: none"> ◆ Understand what fossils tell us about the past in general and about living organisms
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Life Science	<ul style="list-style-type: none"> ◆ Define a fossil ◆ Describe how a fossil is formed ◆ Identify a fossil ◆ Label different types of fossils (e.g., cast, molds, trace, and imprints) 	<ul style="list-style-type: none"> ◆ List similarities between fossils and living organisms ◆ Use fossils to describe animals that lived in the distant past ◆ Match fossils (scientific pictures) with a specific geology (e.g., a nautilus is found in the ocean) 	<ul style="list-style-type: none"> ◆ Compare and contrast today's living things with fossils (e.g., use a graphic organizer to compare and contrast) ◆ Summarize the differences and similarities of fossils and living organisms ◆ Illustrate how geology has changed over time based on the fossil record (e.g., oceans where now there are mountains, etc.)

Entry Points – Grade 8

Science

CONTENT Science

STRAND Structure of Matter

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Matter and Reactions	8.3.2	Construct a model of an atom and know the atom is composed of protons, neutrons, and electrons.	◆ Know what comprises an atom and construct a model
Less Complex		Possible Entry Points	More Complex
Matter and Reactions	<u>The student will:</u>		<u>The student will:</u>
	<ul style="list-style-type: none"> ◆ Define atom ◆ Name simple elements (hydrogen, oxygen, carbon) 	<ul style="list-style-type: none"> ◆ Name each particle of the atom using different size models for each particle of the atom (protons, electrons, neutrons) ◆ Understand simple elements (carbon, hydrogen, oxygen) have a certain number of atoms C =6 O =8 H=1 ◆ Locate the particles of an atom using a model 	<ul style="list-style-type: none"> ◆ Construct a model of an atom ◆ Combine shapes to make the “Modern Model of an Atom”

CONTENT Science

STRAND Matter and Reactions

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Matter and Reactions	8.4.1	Using a periodic chart, explain that the atoms of any element are similar to each other, but they are different from atoms of other elements. Know that the atoms of a given isotope are identical to each other.	<ul style="list-style-type: none"> ◆ Explain similarities and differences of atoms among elements
Less Complex		Possible Entry Points	More Complex
	<u>The student will:</u>	<u>The student will:</u>	<u>The student will:</u>
Matter and Reactions	<ul style="list-style-type: none"> ◆ Using the periodic table and charts, identify the atomic number (C, H, O) ◆ Find a specific element on the periodic table 	<ul style="list-style-type: none"> ◆ Classify the isotopes of common atoms (C,H,O) ◆ Distinguish between a family (down on a periodic chart) and a period (across on a periodic chart) ◆ Identify characteristics of a family on the periodic table. 	<ul style="list-style-type: none"> ◆ Calculate the differences of atoms and their isotopes of simple elements C,H,O (C=6 H=1, O=8) ◆ Determine which atom is heavier and which atom is lighter by the atomic weight of the isotope <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $\text{C} \begin{matrix} 6 \\ 7 \end{matrix} = 13$ </div>

CONTENT Science

STRAND Matter and Reactions

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Matter and Reactions	8.5.5	Understand how an ion is an atom or group of atoms (molecule) that has acquired an electric charge by losing or gaining one or more electrons.	<ul style="list-style-type: none"> ◆ Understand what makes up an ion and how an ion becomes charged
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Matter and Reactions	<ul style="list-style-type: none"> ◆ Identify electron, proton, neutron ◆ Define and locate ions (negative and positive) 	<ul style="list-style-type: none"> ◆ Recognize the perfect rule of eight (octet) in the Noble Gas Family (Happy Family) ◆ Identify the magic number (perfect 8) transfer of electrons to make magic eight (e.g., Sort using a puzzle piece of (Na⁺) ion and (Cl⁻) ion students will find how ions come together to make a compound) 	<ul style="list-style-type: none"> ◆ Using a model or manipulatives student will explain how ions are formed from atoms (ions gain or lose electrons) ◆ Use a model to explain covalent and electrovalent bonds

CONTENT Science
 STRAND Matter and Reactions

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Matter and Reactions	8.7.2	Explain how the idea of atoms explains the conservation of matter: <i>In chemical reactions, the number of atoms stays the same no matter how they are arranged, and the mass of atoms does not change significantly in chemical reactions. so their total mass stays the same.</i>	<ul style="list-style-type: none"> ◆ Explain conservation of matter using Dalton's idea of the atom
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Matter and Reactions	<ul style="list-style-type: none"> ◆ When given a basic compound, identify the number of atoms that remain the same ◆ List and match the basic elements to their Atomic Identity (<i>Atomic Identity equals Atomic Number it never changes</i>) 	<ul style="list-style-type: none"> ◆ Compare the size of atomic masses (e.g., using pictures or models) ◆ Using models, label the different elements that make up given basic compounds [H₂O, CH₄, CO₂] 	<ul style="list-style-type: none"> ◆ Explain Dalton's Atomic Theory (e.g, Produce a model that demonstrates that atoms of the same element have the same atomic number but different atomic mass or that different elements have different atomic masses and different atomic numbers) ◆ Using Dalton's Theory, distinguish the difference between an element and a compound

CONTENT Science
 STRAND Matter and Reactions

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Matter and Reactions	8.8.3	Explain that reactions occur at different rates, slow to fast, and that reaction rates can be changed by changing the concentration of reactants, the temperature, the surface areas of solids, and by using a catalyst	<ul style="list-style-type: none"> ◆ Explain what changes reaction rates
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Matter and Reactions	<ul style="list-style-type: none"> ◆ Distinguish between a slow reaction and fast reaction ◆ Define reaction rate ◆ Define catalyst 	<ul style="list-style-type: none"> ◆ Identify ways to change reaction rates (e.g., changing concentration of reactants, changing the temperature, changing the surface area of a solid or by using a catalyst) ◆ Using pictures, identify catalysts that change the rate of reaction (e.g., salt added to water will result in water boiling faster) ◆ Identify how different surface areas can change the rate of a reaction {Example: Using a colored solution such as: Kool-Aid, sugar, and water at different temperatures observe the solubility of sugar} 	<ul style="list-style-type: none"> ◆ Describe different types of reactions using pictures, diagrams, and/or videos to demonstrate rates of reaction ◆ Explain how concentration of water and rate of reaction can change (e.g., different pots of water boiling with different concentrations)

CONTENT Science
 STRAND Matter and Reactions

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Matter and Reactions	8.8.4	Recognize that solutions can be acidic, neutral, or basic, depending on the concentration of hydrogen ions in the solution. Understand that because this concentration can vary over a very large range, the logarithmic pH scale is used to describe how acidic or basic a solution is (<i>each increase of one in the pH scale is an increase of 10 times in concentration</i>).	<ul style="list-style-type: none"> ◆ Understand logarithmic pH scale as it relates to acidic, basic, and neutral solutions
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Matter and Reactions	<ul style="list-style-type: none"> ◆ Classify solutions as acidic (such as vinegar), basic, (soap) neutral (water) ◆ Classify common foods that are basic, acidic, neutral 	<ul style="list-style-type: none"> ◆ Interpret pH strips identifying acid, base, and neutral ◆ Identify the pH scales 	<ul style="list-style-type: none"> ◆ Distinguish the differences between acidic, basic, neutral solutions ◆ Establish the pH of different solutions by comparing each solution on a pH scale ◆ Explain how the amount of hydrogen ion determines the pH using a colored pH scale, Physical Science page 245 milk-ph-6

CONTENT Science

STRAND Energy and Waves

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Energy and Waves	8.12.2	Describe kinetic energy as the energy of motion (e.g., a rolling ball), and potential energy as the energy of position or configuration (e.g., a raised object or a compressed spring).	<ul style="list-style-type: none"> Describe kinetic and potential energy
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Energy and Waves	<ul style="list-style-type: none"> Using words, objects, or pictures, match energy to a definition of energy Define potential and kinetic 	<ul style="list-style-type: none"> Demonstrate kinetic (roll ball) Demonstrate potential energy (about to roll a ball) Define kinetic energy and give an example Define potential energy and give an example 	<ul style="list-style-type: none"> Classify pictures of kinetic energy (e.g., ball rolling and roller coaster) and potential energy (e.g., a person about to shoot a basketball or a person about to dive) Demonstrate an understanding of potential and kinetic energy (e.g. given a ball, student will push the ball when asked to demonstrate kinetic energy)

CONTENT Science
STRAND Energy and Waves

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Energy and Waves	8.12.6	Know that the sun's radiation consists of a wide range of wavelengths, mainly visible light, infrared and ultraviolet radiation.	<ul style="list-style-type: none"> ◆ Describe the different wavelengths of the sun's radiation
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>	<u>The student will:</u>		<u>The student will:</u>
Energy and Waves	<ul style="list-style-type: none"> ◆ Describe how the primary colors or secondary colors relate to visible light through a prism ◆ Identify visible light, ultra-violet light, or florescent light 	<ul style="list-style-type: none"> ◆ Using the appropriate equipment (prisms, mirrors, sun light, and kaleidoscopes) identify sun as the source of the most visible light ◆ Order the wavelengths from shortest to longest (infrared light, visible light, ultra-violet light) 	<ul style="list-style-type: none"> ◆ Know the different types of wavelengths that are emitted by the sun compared to other forms of light (e.g., artificial light, gamma rays, microwaves, x-rays) ◆ Describe the different sources of electromagnetic waves (sun and artificial light)

CONTENT Science
STRAND Energy and Waves

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Energy and Waves	8.15.2	Investigate and explain that heat energy is a common product of an energy transformation, such as in biological growth, the operation of machines, the operation of a light bulb, and the motion of people.	<ul style="list-style-type: none"> ◆ Explain heat energy is often a product of energy transformation
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Energy and Waves	<ul style="list-style-type: none"> ◆ Define heat energy ◆ Define energy transformation 	<ul style="list-style-type: none"> ◆ List the machines used in the room and explain how heat energy is transferred while machines are doing work (e.g., pencil sharpener, computer, etc.) ◆ Plant a seed in soil and record the change in temperature over a period of time 	<ul style="list-style-type: none"> ◆ Explain how living things (plants or animals), machines (objects) can transform energy to heat ◆ Explain using graphic organizers how energy is transformed ◆ Plant a seed in soil and compare the temperature of the soil and growth of the plant to the transformation of energy

CONTENT Science
 STRAND Energy and Waves

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Energy and Waves	8.16.1	Explain that in processes at the scale of atomic size or greater, energy cannot be created or destroyed but only changed from one form into another.	<ul style="list-style-type: none"> ◆ Explain the law of conservation of energy
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Energy and Waves	<ul style="list-style-type: none"> ◆ Define potential energy ◆ Define kinetic energy ◆ Match the term 'potential' with examples potential energy ◆ Match the term 'kinetic' with examples kinetic energy 		<ul style="list-style-type: none"> ◆ Use different objects to demonstrate kinetic energy (e.g., balloons, fur, feathers, etc.) by running object across different surfaces ◆ Using pictures, classify different types of energy produced
			<ul style="list-style-type: none"> ◆ Create a diagram (using a graphic organizer) and identify the different forms of energy <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p>Example: potential energy → kinetic energy → thermal energy</p> </div> <ul style="list-style-type: none"> ◆ Define the law of conservation of energy

CONTENT Science

STRAND Energy and Waves

Grade 8			
Learning Standards as written			Essential and Prioritized Skill
Energy and Waves	8.15.4	Compare and contrast how heat energy can be transferred through radiation, convection, or conduction.	◆ Compare and contrast how heat energy is transferred (radiation, convection, and conduction)
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Energy and Waves	<ul style="list-style-type: none"> ◆ Match the term 'radiation' with examples of radiation energy using pictures or words ◆ Match the term 'conduction' with examples of conduction energy using pictures or words ◆ Match the term 'convection' with examples of convection energy using pictures or words 	<ul style="list-style-type: none"> ◆ Show the differences of the forms of heat energy using a graphic organizer ◆ List three ways that heat is transferred ◆ Using a graphic organizer, describe similarities of heat energy 	<ul style="list-style-type: none"> ◆ Using a graphic organizer, describe similarities and differences of heat energy ◆ Show the similarities and differences of the forms of heat energy using a graphic organizer

CONTENT Science**STRAND** Forces

Grade 8			
Learning Standards as Written			Essential and Prioritized Skill
Forces	8.10.1	Explain that every object exerts an attractive gravitational force on every other object.	<ul style="list-style-type: none"> Understand gravitational force as it relates to objects.
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
	<ul style="list-style-type: none"> Define gravitational force. Identify an object that exerts a gravitational force. 	<ul style="list-style-type: none"> Demonstrate gravitational force. Use different objects to demonstrate gravitational force. 	<ul style="list-style-type: none"> Using a diagram, compare the amount of gravitational force acting between objects. Explain how an object's weight is a measure of the gravitational force of a planet/moon acting on that object.

Grade 8			
Learning Standards as Written			Essential and Prioritized Skill
Forces	8.11.1	Recognize that a force has both magnitude and direction.	<ul style="list-style-type: none"> Understand vector quantity.
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
	<ul style="list-style-type: none"> Define magnitude and direction. Distinguish between magnitude and direction. 	<ul style="list-style-type: none"> Illustrate the magnitude of two objects. Using objects, demonstrate a force. 	<ul style="list-style-type: none"> Using a diagram, demonstrate a force. Classify vectors using quantities.

CONTENT Science

STRAND Forces

Grade 8			
Learning Standards as Written			Essential and Prioritized Skill
Forces	8.11.2	Observe and explain that when the forces on an object are balanced (equal and opposite forces that add up to zero), the motion of the object does not change.	<ul style="list-style-type: none"> Demonstrate and understanding that when the forces on an object are balanced, the motion of the object does not change.
Less Complex		Possible Entry Points	More Complex
The student will:		The student will:	The student will:
	<ul style="list-style-type: none"> Define motion Identify a balanced force. 	<ul style="list-style-type: none"> Define equal and opposite forces. List three examples of a balanced force. Using words, objects, or pictures, match balanced forces to a definition of balanced forces. 	<ul style="list-style-type: none"> Draw a diagram to show a balanced force. Describe how forces affect the motion of an object.

DC CAS-Alt

Entry Points –

CONTENT Science

STRAND Cell Biology and Biochemistry

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Cell Biology	B.2.2	Compare and contrast the general anatomy and constituents of prokaryotic cells and their distinguishing features: Prokaryotic cells do not have a nucleus, and eukaryotic cells do. Know that prokaryotic organisms are classified in the Eubacteria and Archaeobacteria Kingdoms and that organisms in the other four kingdoms have eukaryotic cells.	Compare and contrast anatomy of prokaryotic and eukaryotic cells
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Cell Biology and Biochemistry	<ul style="list-style-type: none"> ◆ Define prokaryotic and eukaryotic cells ◆ Identify prokaryotic and eukaryotic cells ◆ Label a drawing/picture of a prokaryotic or eukaryotic cell 	<ul style="list-style-type: none"> ◆ Classify cells as prokaryotic or eukaryotic ◆ Explain the differences between prokaryotic and eukaryotic cells using key terms ◆ Label the similarities and/or differences between the prokaryotic and eukaryotic cells 	<ul style="list-style-type: none"> ◆ Using technology (e.g., switches, computers, cards, etc.) compare and contrast organisms that have prokaryotic or eukaryotic cells ◆ Distinguish the similarities and differences between prokaryotic and eukaryotic cells (using a graphic organizer)

CONTENT Science

STRAND Cell Biology and Biochemistry

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Cell Biology	B.3.3	Demonstrate that most cells function best within a narrow range of temperature and pH; extreme changes usually harm cells by modifying the structure of their macromolecules and, therefore, some of their functions.	<ul style="list-style-type: none"> ◆ Demonstrate that most cells function best within a narrow range of tolerances (temperature and pH)
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Cell Biology and Biochemistry	<ul style="list-style-type: none"> ◆ Define pH, acid (substance that has a low pH level), base (substance that has a high pH level), solution, and temperature ◆ Identify the tools used to measure pH levels (pH scale, pH meter, and litmus paper) and temperature 	<ul style="list-style-type: none"> ◆ Describe how varying temperatures affect human cellular functions ◆ Compare how different pH levels affect cell function 	<ul style="list-style-type: none"> ◆ Demonstrate how the environment affects cell function (e.g., use pH strips to demonstrate how pH levels affect cells) ◆ Compare and contrast how varying pH levels affect different cell functions and identify optimum pH levels

CONTENT Science

STRAND Cell Biology and Biochemistry

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Cell Biology	B.3.7	Recognize and describe that cellular respiration is important for the production of adenosine triphosphate (ATP), which is the basic energy source for cell metabolism.	<ul style="list-style-type: none"> Recognize and describe cellular respiration and the production of ATP
Less Complex		Possible Entry Points	More Complex
The student will:		The student will:	The student will:
Cell Biology and Biochemistry	<ul style="list-style-type: none"> Define respiration (taking in oxygen and releasing carbon dioxide), cellular respiration (chemical process by which the mitochondria produce energy for the cell), mitochondria (organelle that breakdowns food molecules to produce ATP- the battery of the cell that stores energy), and/or metabolism (activities of living things, e.g., reproduction, respiration, eating, etc.) Match the terms respiration, cellular respiration, ATP, mitochondria, and/or metabolism to the correct definition Explain the basic function of photosynthesis (to make food) 	<ul style="list-style-type: none"> Classify various metabolic activities or uses of energy (growth, reproduction, respiration, etc.) Identify the vital metabolic functions that require ATP energy (e.g., digestion, circulation, reproduction, growth, etc.) 	<ul style="list-style-type: none"> Compare (using a graphic organizer) the relationship between cellular respiration and ATP Describe the role of ATP in metabolism Explain how cells get energy from cellular respiration Describe how the products of photosynthesis are used in cellular respiration to produce ATP (e.g., describe how the glucose is broken down into carbon compounds, ATP, and other energy carriers during the citric acid cycle)

CONTENT Science

STRAND Cell Biology and Biochemistry

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Cell Biology	B.4.3	Describe the organelles that plant and animal cells have in common (e.g., ribosomes, golgi bodies, endoplasmic reticulum) and some that differ (e.g., only plant cells have chloroplasts and cell walls).	Compare and contrast plant cell organelles and animal cell organelles
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Cell Biology and Biochemistry	<ul style="list-style-type: none"> ◆ Define or identify the commonly found organelles (wall, no wall, chloroplast, membrane, cytoplasm, nucleus) in plants and/or animal cells ◆ Label the diagrams of a plant and animal cells 	<ul style="list-style-type: none"> ◆ Distinguish between plant and animals cells ◆ Using a graphic organizer classify organelles (wall, no wall, chloroplast, membrane, cytoplasm, nucleus) commonly found in plant and animal cells 	<ul style="list-style-type: none"> ◆ Using a Venn Diagram compare and contrast plant and animal cell organelles (wall, no wall, chloroplast, membrane, cytoplasm, nucleus) ◆ Identify the similarities and differences in plant cell organelles and animal cell organelles

CONTENT Science

STRAND Cell Biology and Biochemistry

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Cell Biology	B.4.4	Describe that the work of the cell is carried out by structures made up of many different types of large (macro) molecules that it assembles, such as proteins, carbohydrates, lipids, and nucleic acids.	<ul style="list-style-type: none"> ◆ Describe cellular construction of macromolecules and the <u>jobs of these structures</u> (reproduction, respiration, etc.)
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Cell Biology and Biochemistry	<ul style="list-style-type: none"> ◆ Define proteins, carbohydrates, lipids, and/or nucleic acids ◆ Define cell function and/or cell structure 	<ul style="list-style-type: none"> ◆ Identify the types of macromolecules (lipids, carbohydrates, and nucleic acids) and the function they serve ◆ Describe the characteristics of macromolecules 	<ul style="list-style-type: none"> ◆ Describe why the body needs macromolecules (lipids, carbohydrates, and nucleic acids) ◆ Illustrate cell structure and identify how each molecule contributes to cell function

CONTENT Science

STRAND Genetics and Evolution

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Genetics	B.7.2	Explain how hereditary information is passed from parents to offspring in the form of “genes,” which are long stretches of DNA consisting of sequences of nucleotides. Explain that in eukaryotes, the genes are contained in chromosomes, which are bodies made up of DNA and various proteins.	<ul style="list-style-type: none"> ◆ Explain how hereditary information is passed via genes
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Genetics and Evolution	<ul style="list-style-type: none"> ◆ Identify that inherited characteristics are called “traits” ◆ Identify characteristics that are inherited (passed down from parents) 	<ul style="list-style-type: none"> ◆ Explain the role of offspring, genes, DNA, and chromosomes in the heredity process ◆ Identify the relationship between offspring and heredity ◆ Explain that genes are passed from parent to offspring ◆ Explain that sexual reproduction leads to offspring with traits similar to each parent ◆ Explain that asexual reproduction results in offspring identical to the parent 	<ul style="list-style-type: none"> ◆ Describe the relationship between genes and chromosomes ◆ Use manipulatives to demonstrate the relationship between genes and chromosomes ◆ Use manipulatives to show the relationship between DNA and chromosomes ◆ Describe the structure of chromosomes and explain how hereditary information is passed to offspring in genes ◆ Identify and describe similarities and differences among multiple offspring of the same parents (plant or animal) ◆ Explain that the cell contains genes that are responsible for characteristics that are passed down from parent to offspring

CONTENT Science

STRAND Genetics and Evolution

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Genetics	B.7.5	Differentiate between the functions of mitosis and meiosis. Mitosis is a process by which a cell divides into each of two daughter cells, each of which has the same number of chromosomes as the original cell. Meiosis is a process of cell division in organisms that reproduce sexually, during which the nucleus divides eventually into four nuclei, each of which contains half of the usual number of chromosomes.	<ul style="list-style-type: none"> ◆ Differentiate between mitosis and meiosis
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Genetics and Evolution	<ul style="list-style-type: none"> ◆ Define mitosis, meiosis, and daughter cells ◆ Identify graphic representations of mitosis and meiosis ◆ Recognize that cells become old and need to be replaced ◆ Recognize that cells reproduce 	<ul style="list-style-type: none"> ◆ Describe each step of mitosis or meiosis (using technology or models) ◆ Explain that mitosis is the division of body cells ◆ Explain that meiosis is the division of sex cells (egg, sperm, etc.) ◆ Determine what kind of cells divide through the process of mitosis and/or meiosis. 	<ul style="list-style-type: none"> ◆ Differentiate between mitosis and meiosis using a graphic organizer ◆ Illustrate or model mitosis and meiosis ◆ Compare and contrast mitosis and meiosis (e.g., using a Venn Diagram)

CONTENT Science

STRAND Genetics and Evolution

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Genetics	B.8.2	Explain how the genetic information in DNA molecules provides the basic form of instructions for assembling protein molecules and that this mechanism is the same for all life forms.	<ul style="list-style-type: none"> ◆ Explain that DNA molecules instruct assembly of protein molecules in all life forms
Less Complex		Possible Entry Points	More Complex
The student will:		The student will:	The student will:
Genetics and Evolution	<ul style="list-style-type: none"> ◆ List parts of a DNA molecule (bases- Adenine (A), Guanine (G), Thymine (T) and Cytosine (C), sugar, and phosphate) ◆ Identify DNA and protein molecules 	<ul style="list-style-type: none"> ◆ Explain the relationship between DNA molecules and protein molecules (using a graphic organizer to show/explain the relationship) ◆ Label or color code the parts of a DNA molecule 	<ul style="list-style-type: none"> ◆ Distinguish between a DNA molecule and a protein molecule (using pictures or models) ◆ Describe the make-up of a DNA molecule (sugar made up of hydrogen and protein bases that is a spiral helix)

CONTENT Science

STRAND Genetics and Evolution

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Genetics	B.8.3	Understand and explain that specialization of cells is almost always due to different patterns of gene expression, rather than differences in the genes themselves.	<ul style="list-style-type: none"> Understand and explain the specialization of cells
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Genetics and Evolution	<ul style="list-style-type: none"> Describe cell specialization List different types of cells found in the body (e.g., nerve, muscle, and blood) 	<ul style="list-style-type: none"> Determine that organs of the body have specialized cells (matching, graphic organizer, picture, etc.) Explain the function of specialized cells (nerve, muscle, and blood.) 	<ul style="list-style-type: none"> Use drawings or models to compare the relationship of specialized cells and organs of the body Describe the specific function or job of the cells (e.g., blood cells, muscle cells, nerve cells, etc.)

CONTENT Science

STRAND Genetics and Evolution

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Genetics	B.9.2	Explain the mechanisms of genetic mutations and chromosomal recombinations, and when and how they are passed on to offspring.	◆ Explain that genetic mutations can cause a genetic disorder
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Genetics and Evolution	<ul style="list-style-type: none"> ◆ Define genetic disorders as a result of genetic mutation ◆ Identify some genetic disorders based on characteristics (Down Syndrome, Cystic Fibrosis, Hemophilia, etc.) 	<ul style="list-style-type: none"> ◆ Explain how and when genetic disorders are passed to offspring, using pictorial representation and technology ◆ Given various diseases and disorders, classify as either genetic or non-genetic (using technology or pictorial representation) ◆ Identify how DNA can change or mutate 	<ul style="list-style-type: none"> ◆ Describe how genetic disorders are caused by genetic mutations (using technology, film, etc.) ◆ Explain how mutations can be harmful or beneficial by using pictorial representations and technology/films (flower, fruits with no seeds, etc.)

CONTENT Science

STRAND Genetics and Evolution

High School Biology			
Learning Standards as written			Essential and Prioritized Skill
Genetics	B.9.3	Explain how the sorting and recombination of genes in sexual reproduction result in a vast variety of potential allele combinations in the offspring of any two parents.	<ul style="list-style-type: none"> ◆ Explain how sexual reproduction results in variety
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
Genetics and Evolution	<ul style="list-style-type: none"> ◆ Define the terms allele /number of allele found in both male and females, (part of the gene that determines traits; every sperm and egg has 23) sexual reproduction (coming together of a sperm and egg which produces a gamete), gamete (the union of a sperm and egg) ◆ List the components of sexual reproduction (sperm, egg, and gamete) ◆ Identify organisms that reproduce sexually (using pictorial representation) 	<ul style="list-style-type: none"> ◆ List and describe the components of sexual reproduction (sperm, egg, and gamete) ◆ Describe how traits of an offspring depend on the combination of dominant and recessive alleles 	<ul style="list-style-type: none"> ◆ Summarize the types of organisms that carry out sexual reproduction using a graphic organizer to describe the sperm (male), egg (female), and gamete of human offspring ◆ Explain how sexual reproduction leads to variation in offspring ◆ Identify single-gene traits and describe all possible genotypic and phenotypic combinations (e.g., choose two traits that follow simple Mendelian inheritance rules)

CONTENT Science**STRAND** Multicellular Organisms

High School Biology			
Learning Standards as Written			Essential and Prioritized Skill
Multicellular Organisms: Plants and Animals	B.12.3	Explain that during the process of photosynthesis, plants release oxygen into the air.	Understand the process of photosynthesis.
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
<ul style="list-style-type: none"> Define photosynthesis. Match the terms oxygen, photosynthesis, carbon dioxide, energy to the correct definition. 		<ul style="list-style-type: none"> List what plants need to carry out photosynthesis. Label a basic photosynthesis diagram. 	<ul style="list-style-type: none"> Describe the process of photosynthesis. Create a diagram of photosynthesis.

High School Biology			
Learning Standards as Written			Essential and Prioritized Skill
Multicellular Organisms: Plants and Animals	B.13.1	Identify the roles of plants in the ecosystem: Plants make food and oxygen, provide habitats for animals, make and preserve soil, and provide thousands of useful products for people (e.g., energy, medicines, paper, and resins).	Identify the roles of plants in the ecosystems.
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
<ul style="list-style-type: none"> Define ecosystem. List three organisms found in an ecosystem. 		<ul style="list-style-type: none"> Identify products that are derived from plants. List three ways animals depend on plants. 	<ul style="list-style-type: none"> Identify the role that plants play in an ecosystem. Identify what specific plants do in two different ecosystems.

CONTENT Science

STRAND Multicellular Organisms

High School Biology			
Learning Standards as Written			Essential and Prioritized Skill
Multicellular Organisms: Plants and Animals	B.14.1	Explain the major systems of the mammalian body (digestive, respiratory, reproductive, circulatory, excretory, nervous, endocrine, integumentary, immune, skeletal, and muscular) and how they interact with each other.	Explain three major systems of the mammalian body.
Less Complex		Possible Entry Points	More Complex
<u>The student will:</u>		<u>The student will:</u>	<u>The student will:</u>
	<ul style="list-style-type: none"> Recognize three major systems of the body. Identify body systems used for breathing, moving, and eating. 	<ul style="list-style-type: none"> Using a diagram, label three major systems of the mammalian body. Match three major systems of the body with their functions. 	<ul style="list-style-type: none"> Using a Venn Diagram, compare two of the major systems of the body. Describe how two major systems of the body interact with each other.