

FSD Science Curriculum

June 2012

K-12 Broad Goals of Science Education

1. Students will use inquiry strategies to investigate and understand the natural world.
2. Students will demonstrate an understanding of key concepts and principles central to the biological, physical, and earth sciences, and engineering, while recognizing the interrelationship of all the sciences.
3. Students will demonstrate an understanding of the basic laws which govern and explain phenomena observed in the natural world
4. Students will demonstrate an understanding of, and be able to practice, the basic processes which scientists use to obtain and continually revise knowledge about the natural world.
5. Students will perceive that scientific and technological knowledge is the result of the cumulative efforts of people, past and present, who have attempted to explain the world through an objective, peer-tested, rational approach to understanding natural phenomena and occurrences.
6. Students will display a sense of curiosity and wonder about the natural world, and demonstrate an increasing awareness of the interdependence between all living things and the environment.
7. Students will demonstrate their abilities to identify human needs and concerns and to engage in problem-solving processes to define the problem, research and generate solutions, and develop simulations and prototypes to test their ideas before implementation.
8. Students will be able to apply rational, creative-thinking, and investigative skills and use scientific and technical knowledge in their roles as citizens, workers, family members, and consumers in an increasingly technological society.
9. Students will use oral and written communication, mathematical representation, and physical and conceptual models to describe and explain scientific concepts and ideas, and will be able to apply scientific and technical knowledge.
10. Students will know and employ safe practices and techniques in the laboratory, in field work or any other scientific investigation, and when using scientific or technological materials at home or work.

ELEMENTARY – GRADES K to 4 USING SCIENCE TO EXPLORE THE WORLD

Children in grades K-4 observe, describe, and interact with the world around them. At this level effective learning environments provide opportunities for developing awareness of and involvement with the world around them through:

- Playing with, exploring, collecting, handling, sorting, and classifying objects.
- Using graphic organizers and other strategies to motivate, organize, and identify the questions children ask about the world. [*Test Guess*]
- Using tools (for example: non standard measures, rulers, and magnifiers) to enhance observations, collect, represent and interpret data.
- Organizing and manipulating data in multiple ways, which may include tools of technology, e.g., calculators, and computers.
- Communicating (through reading, writing, speaking, listening, movement and viewing) to describe their observations of the world.

In summary, the K-4 classroom should provide students opportunities to engage with concrete manipulative activities that will lead children to construct the desired concepts through investigation and analysis of experience. At this level in particular, science should be integrated with other curricular areas (e.g., reading, writing, math, social studies, technology, art, music, or physical education).

K – 2

Process Skills

Scientific Inquiry and Critical Thinking Skills

MAKING OBSERVATIONS AND ASKING QUESTIONS

S:SPS1:2:1.1 Make observations and explore materials using all of their senses (one sense at a time).

Student Friendly/"I Can..." Statement	Resources	Assessments
<ol style="list-style-type: none">1. Define senses.2. Define observation.3. Define inference.4. Compare observations and inferences.5. Use the senses to describe and identify the properties of objects6. Use the senses to identify the materials that make up an object7. Sort objects based on size, material, color, shape and mass8. Identify every day sounds9. Compare different sounds10. Recognize the ear as the organ receiving sounds11. Determine sour, sweet, bitter, and salty foods by taste.12. Identify objects by feel (soft, smooth, rough, hard, cold, hot).		

S:SPS1:2:1.2 Record observations using language, concrete objects, and symbolic representations.

Student Friendly/"I Can..." Statement	Resources	Assessments
<ol style="list-style-type: none">1. Demonstrate appropriate use of tools.2. Define symbolic representation.3. Define concrete objects.4. Write a sentence about observations.5. Record observations using language.6. Record observations using concrete objects.7. Record observations using symbolic representations.		

8. Record observations using language, concrete objects and symbolic representations.		
S:SPS1:2:1.3 Ask questions about objects, organisms and events in their immediate environment.		
Student Friendly/"I Can..." Statement 1. Define organisms. 2. Define Events. 3. Define immediate environment. 4. Observe objects, organisms, and events. 5. Formulate questions.	Resources	Assessments
S:SPS1:2:1.5 Sort and classify object materials and events based on one or more attributes; and explain the methods used for sorting.		
Student Friendly/"I Can..." Statement 1. Identify and define attributes of materials. 2. Describe methods for sorting. 3. Sort and classify materials and events. 4. Explain method used to sort specific objects and events.	Resources	Assessments
DESIGNING SCIENTIFIC INVESTIGATIONS		
S:SPS1:2:2.1 Select tools and procedures, in a purposeful way, to explore objects and materials		
Student Friendly/"I Can..." Statement 1. Identify tools used to explore objects and materials. 2. Identify procedures used to explore objects and materials.	Resources	Assessments
S:SPS1:2:2.2 Suggest a plan and describe a sequence of events for conducting an exploration.		
Student Friendly/"I Can..." Statement 1. Identify procedures used to explore objects and materials. 2. Understand Scientific method. 3. Determine sequence of events. 4. Explain plan for carrying out exploration.	Resources	Assessments
S:SPS1:2:2.3 Predict how changing one part of an exploration will affect the outcome.		
Student Friendly/"I Can..." Statement 1. Define parts of an exploration. 2. Make predictions. 3. Change variables. 4. Identify outcome. 5. Explain change in outcome.	Resources	Assessments
CONDUCTING SCIENTIFIC INVESTIGATIONS		

S:SPS1:2:3.1 Follow their own plan for conducting an investigation.		
Student Friendly/"I Can..." Statement 1. Identify materials needed. 2. Identify sequence of events. 3. Perform investigation.	Resources	Assessments
S:SPS1:2:3.2 Follow a simple step-by-step procedure.		
Student Friendly/"I Can..." Statement 1. Identify materials needed. 2. Read sequence of events. 3. Conduct investigation.	Resources	Assessments
REPRESENTING AND UNDERSTANDING RESULTS OF INVESTIGATIONS		
S:SPS1:2:4.1 Represent and interpret information and observations in many ways (such as in tally, pictographs, bar graphs, tables).		
Student Friendly/"I Can..." Statement 1. Represent observations as tallies. 2. Interpret information in tallies. 3. Represent observations as pictographs. 4. Interpret information in pictographs. 5. Represent observations as bar graphs. 6. Interpret information in bar graphs. 7. Represent observations in tables. 8. Interpret information in tables.	Resources	Assessments
S:SPS1:2:4.2 Identify and describe patterns and relationships in observed objects and events.		
Student Friendly/"I Can..." Statement 1. Identify patterns. 2. Recognize relationships between observed objects and events. 3. Explain patterns and relationships in given observations.	Resources	Assessments

Unifying Concepts of Science

NATURE OF SCIENCE (NOS)		
S:SPS2:2:1.1 Recognize that information can be obtained merely by careful observation, but sometimes even more data can be collected by conducting scientific investigations.		
Student Friendly/"I Can..." Statement 1. Make observations 2. Conduct investigation 3. Compare data from observation and investigations.	Resources	Assessments
S:SPS2:2:1.2 Discover that when a scientific investigation is done the way it was done before, we expect to get a very similar result.		
Student Friendly/"I Can..." Statement 1. Follow procedures to perform scientific investigation two or more times. 2. Record results of investigation. 3. Compare results.	Resources	Assessments
S:SPS2:2:1.3 Explain that sometimes people aren't sure what will happen because they don't know all the factors that may have an effect on the outcome.		
Student Friendly/"I Can..." Statement 1. Conduct a scientific investigation. 2. Identify factors in an investigation. 3. Explain how factors can change outcomes.	Resources	Assessments
SYSTEMS AND ENERGY (SAE)		
S:SPS2:2:2.1 Show how most things are made of parts.		
Student Friendly/"I Can..." Statement 1. Define whole and parts. 2. Show how parts make up a whole. 3. Show how a whole is made up of parts.	Resources	Assessments
S:SPS2:2:2.2 Observe that when parts are put together, they can do things that they couldn't do by themselves.		
Student Friendly/"I Can..." Statement 1. Show how parts combined are greater than each individual part. 2. Show how combination of parts change the action of the whole.	Resources	Assessments
S:SPS2:2:2.3 Explain that something may not work if some of its parts are missing.		
Student Friendly/"I Can..." Statement 1. Explain how parts are important to the whole. 2. Explain which parts affect the whole.	Resources	Assessments

MODELS AND SCALE (MAS)		
S:SPS2:2:3.1 Describe how a model of something is different from the real thing but can be used to learn something about the real thing.		
Student Friendly/"I Can..." Statement 1. Define model. 2. Compare model and real life object. 3. Understand models represent real life object.	Resources	Assessments
S:SPS2:2:3.2 Explain how one way to describe something is to say how it is like something else.		
Student Friendly/"I Can..." Statement 1. Define analogy. 2. Describe how analogies help understanding.	Resources	Assessments
S:SPS2:2:3.3 Provide examples to explain that things in nature and things people make have very different sizes, weights, ages and speeds.		
Student Friendly/"I Can..." Statement 1. Identify how similar objects (trees, rocks, people, etc.) have different attributes. 2. Compare types of the same things.	Resources	Assessments
PATTERNS OF CHANGE (POC)		
S:SPS2:2:4.1 Discover that things change in some ways and stay the same in some ways.		
Student Friendly/"I Can..." Statement 1. Describe how things are the same. 2. Describe how things change.	Resources	Assessments
S:SPS2:2:4.2 Understand that people can keep track of some things by seeing where they come from and where they go.		
Student Friendly/"I Can..." Statement 1. Describe how tracking helps explain things.	Resources	Assessments
S:SPS2:2:4.3 Observe that things can change in different ways, such as in size, weight, color and movement.		
Student Friendly/"I Can..." Statement 1. Observe changes. 2. Describe changes.	Resources	Assessments
FORM AND FUNCTION (FAF)		
S:SPS2:2:5.1 Identify shape and use of objects.		
Student Friendly/"I Can..." Statement 1. Identify shapes of objects. 2. Identify use of objects.	Resources	Assessments
S:SPS2:2:5.2 Draw an object and the object in use.		

Student Friendly/"I Can..." Statement	Resources	Assessments
<ol style="list-style-type: none"><li data-bbox="149 228 359 256">1. Draw objects.<li data-bbox="149 256 453 284">2. Depict objects in use.		

Personal, Social, and Technological Perspectives

COLLABORATION IN SCIENTIFIC ENDEAVORS

S:SPS3:2:1.1 Work with a partner to accomplish a specific task.

Student Friendly/"I Can..." Statement 1. Work with a partner to accomplish a task.	Resources	Assessments
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S:SPS3:2:1.2 Take turns.

Student Friendly/"I Can..." Statement 1. Take turns.	Resources	Assessments
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S:SPS3:2:1.3 Ask questions of others about their work.

Student Friendly/"I Can..." Statement 1. Ask questions of others' work.	Resources	Assessments
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COMMON ENVIRONMENTAL ISSUES, NATURAL RESOURCES MANAGEMENT AND CONSERVATION

S:SPS3:2:2.1 Use observation skills to describe the area around their homes and school.

Student Friendly/"I Can..." Statement 1. Define observations. 2. Use observation to describe area around home. 3. Use observations to describe area around school.	Resources	Assessments
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SCIENCE AND TECHNOLOGY, TECHNOLOGICAL DESIGN AND APPLICATION

S:SPS3:2:3.1 Demonstrate that all tools have a special purpose (e.g., to measure, to help in observations, to make things or to make things better).

Student Friendly/"I Can..." Statement 1. Define tools. 2. Define purpose. 3. Describe how tools have a purpose.	Resources	Assessments
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S:SPS3:2:3.2 Provide examples that highlight the importance of the planning phase of any project.

Student Friendly/"I Can..." Statement 1. Define plan. 2. Describe how plans help build a project.	Resources	Assessments
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S:SPS3:2:3.3 Identify multiple ways to solve a design problem.

Student Friendly/"I Can..." Statement 1. Define design.	Resources	Assessments
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2. Explain how a problem can be solved in multiple ways.		
S:SPS3:2:3.4 Describe how most things are made up of multiple parts and explain that things may not work if some parts are missing.		
Student Friendly/"I Can..." Statement 1. Explain how most things are made up of multiple parts. 2. Describe how parts are important to whole.	Resources	Assessments
S:SPS3:2:3.5 Provide examples of how people throughout history have used legends and stories to explain how the world works.		
Student Friendly/"I Can..." Statement 1. Describe how legend and stories explain how the world works.	Resources	Assessments

Science Skills for Information, Communication and Media Literacy

INFORMATION AND MEDIA LITERACY		
S:SPS4:2:1.1 Have experience with a variety of media sources.		
Student Friendly/"I Can..." Statement 1. Describe different media sources. 2. Use various media sources.	Resources	Assessments
S:SPS4:2:1.2 Use tools		
Student Friendly/"I Can..." Statement 1. Describe various tools. 2. Use a variety of tools.	Resources	Assessments
S:SPS4:2:1.3 Use age-appropriate sources such as newspapers, books and websites.		
Student Friendly/"I Can..." Statement 1. Describe various information sources. 2. Use various information sources.	Resources	Assessments
COMMUNICATION SKILLS		
SPS4:2:2.1 Communicate ideas and observations through a variety of tools and formats (e.g., oral, journal, drawing, projects, multimedia).		
Student Friendly/"I Can..." Statement 1. Orally communicate ideas and observations. 2. Use a journal to communicate ideas and observations. 3. Use drawings to communicate ideas and observations. 4. Use projects to communicate ideas and observations. 5. Use multimedia to communicate ideas and observations.	Resources	Assessments
CRITICAL THINKING AND SYSTEMS THINKING		
S:SPS4:2:3.1 Make observations and tell ideas about real-life issues.		
Student Friendly/"I Can..." Statement 1. Make observations about real-life issues. 2. Communicate ideas about real life issues.	Resources	Assessments
SPS4:2:3.2 Use pictures or other means to organize ideas.		
Student Friendly/"I Can..." Statement 1. Use pictures to organize ideas.	Resources	Assessments

:SPS4:2:3.3 Make a graph to represent data.		
Student Friendly/"I Can..." Statement 1. Make a graph to organize and represent data.	Resources	Assessments
PROBLEM IDENTIFICATION, FORMULATION, AND SOLUTION		
S:SPS4:2:4.1 Ask questions and take part in investigations.		
Student Friendly/"I Can..." Statement 1. Ask questions in investigation.	Resources	Assessments
S:SPS4:2:4.2 Compile observations (one to one relationship) by making or using simple pictographs, tally charts or simple graphs.		
Student Friendly/"I Can..." Statement 1. Compile observations. 2. Make simple pictographs of observations. 3. Make tally charts of observations. 4. Make simple graphs of observations.	Resources	Assessments
S:SPS4:2:4.3 Look for evidence to support ideas.		
Student Friendly/"I Can..." Statement 1. Find evidence to support ideas.	Resources	Assessments
CREATIVITY AND INTELLECTUAL CURIOSITY		
S:SPS4:2:5.1 Use computer software and various technologies as appropriate to display and communicate information and ideas.		
Student Friendly/"I Can..." Statement 1. Use computer software to display information. 2. Use computer software to communicate information and ideas. 3. Use various technologies.	Resources	Assessments
INTERPERSONAL AND COLLABORATIVE SKILLS		
S:SPS4:2:6.1 Plan and carry out simple activities with a group.		
Student Friendly/"I Can..." Statement 1. Plan simple activities with a group. 2. Carry out activities with group.	Resources	Assessments
SELF DIRECTION		

S:SPS4:2:7.1 Keep a visual or written journal.		
Student Friendly/"I Can..." Statement 1. Keep visual or written journal.	Resources	Assessments
ACCOUNTABILITY AND ADAPTABILITY		
S:SPS4:2:8.1 Take part in sharing information with another classroom or school as a group.		
Student Friendly/"I Can..." Statement 1. Share information with another classroom. 2. Share information with another school.	Resources	Assessments
SOCIAL RESPONSIBILITY		
S:SPS4:2:9.1 Collaborate, as a group, with another classroom or school.		
Student Friendly/"I Can..." Statement 1. Collaborate with another classroom as a group. 2. Collaborate with another school as a group.	Resources	Assessments

Earth Space Science

ESS1– The Earth and Earth materials, as we know them today, have developed over long periods of time, through constant change processes.

ATMOSPHERE, CLIMATE, AND WEATHER		
S:ESS1:2:1.1 Recognize that weather conditions change frequently, and that weather patterns change over the seasons.		
Student Friendly/"I Can..." Statement 1. Identify weather conditions. 2. Track/record weather over a period of time. 3. Identify weather trends and patterns. 4. Summarize weather patterns in given season.	Resources	Assessments
S:ESS1:2:1.2 Describe and compare weather using observations and measurements of local weather conditions.		
Student Friendly/"I Can..." Statement 1. Observe weather conditions. 2. Analyze weather condition. 3. Compare weather conditions 4. Describe weather conditions at a given time.	Resources	Assessments
COMPOSITION AND FEATURES		
S:ESS1:2:2.1 Recognize that solid rocks, soils, and water in its liquid and solid states can be found on the Earth's surface.		
Student Friendly/"I Can..." Statement 1. Identify rocks. 2. Identify soil. 3. Identify water. 4. Recognize where rocks can be found 5. Recognize where soil can be found. 6. Recognize where water can be found.	Resources	Assessments
S:ESS1:2:2.2 Use observable properties, such as color and texture, to classify and organize rocks and minerals.		
Student Friendly/"I Can..." Statement 1. Define properties. 2. Identify properties of given rocks and minerals. 3. Observe properties of given rocks and minerals. 4. Classify rocks and minerals according to their properties.	Resources	Assessments
S:ESS1:2:2.3 Recognize that Earth materials have a variety of properties, including size, shape, color and texture.		

<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Identify properties of items by size, shape, color, and texture. 2. Recognize that Earth materials have many properties. 	Resources	Assessments
PROCESSES AND RATES OF CHANGE		
S:ESS1:2:5.1 Recognize that some changes are too slow or too fast to be easily observed.		
<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Define change. 2. Observe changes. 3. Identify changes that happen too fast or too slow to see easily. 	Resources	Assessments
ROCK CYCLE		
S:ESS1:2:6.1 Explain that large rocks can be broken down into smaller rocks.		
<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Identify ways rocks can be broken down. 2. Explain how rocks can be broken down. 	Resources	Assessments
S:ESS1:2:6.2 Describe rocks and soils in terms of their physical properties		
<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Identify properties of rocks and solids. 2. Describe rocks and solids in terms of physical properties. 	Resources	Assessments
WATER		
S:ESS1:2:7.1 Recognize that water can be a liquid or a solid; and explain that it can be made to change from one state to the other, but the amount (mass) of water always remains the same in either state.		
<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Understand that water can be solid or liquid. 2. Recognize change in state. 3. Observe that water's mass doesn't change when it goes from solid to liquid. 4. Explain how the mass stays the same even when the states change. 	Resources	Assessments

ESS2– The Earth is part of a solar system, made up of distinct parts, which have temporal and spatial interrelationships.

EARTH, SUN, AND MOON		
S:ESS2:2:1.1 Recognize the basic patterns of the Sun, including its appearance during the daytime, and how its position in the sky changes through the seasons.		
Student Friendly/"I Can..." Statement 1. Observe patterns of the sun. 2. Document position of the sun throughout the day. 3. Document position of the sun throughout the seasons. 4. Identify basic patterns of the sun.	Resources	Assessments
S:ESS2:2:1.2 Recognize the basic patterns of the Moon, including its appearance sometimes at night and sometimes during the day; and how it appears to change shape through the month.		
Student Friendly/"I Can..." Statement 1. Observe patterns of the moon. 2. Document position of the moon throughout the day and night. 3. Document how the observations of the moon change over the month.	Resources	Assessments
ENERGY		
S:ESS2:2:2.1 Recognize that the light and heat the Sun provides to the Earth is necessary for life.		
Student Friendly/"I Can..." Statement 1. Recognize that the sun provides light. 2. Recognize that the sun provides heat. 3. Recognize that light and heat are necessary for life.	Resources	Assessments
VIEW FROM EARTH		
S:ESS2:2:4.1 Recognize that the Sun, Moon and stars all appear to move slowly across the sky.		
Student Friendly/"I Can..." Statement 1. Document position of sun throughout day. 2. Document position of moon throughout night. 3. Document position of stars throughout night. 4. Recognize that movement of sun, moon and stars appears to move slow.	Resources	Assessments
S:ESS2:2:4.2 Recognize that as the position of the Sun changes in relation to the Earth it creates shadows of varying length and direction.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ol style="list-style-type: none"> 1. Document position and length of shadow at different times during the day. 2. Recognize that shadows vary with the position of the sun. 		
<p>S:ESS2:2:4.3 Explain that people should not look directly at the Sun because it is dangerous and may cause injury to the eyes.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Research effect of directly looking at sun. 2. Report on effects of looking directly at the sun. 	<p>Resources</p>	<p>Assessments</p>

ESS3– The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time.

STARS AND GALAXIES

S:ESS3:2:2.1 Recognize there are too many stars to count, and that they are unequal in their brightness.

Student Friendly/"I Can..." Statement	Resources	Assessments
<ol style="list-style-type: none">1. Observe the number of stars.2. Observe the brightness of stars.3. Recognize that there are too many stars to count.4. Recognize that stars vary in brightness.		

ESS4– The growth of scientific knowledge in Earth Space Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

TOOLS		
S:ESS4:2:2.1 Recognize, and with assistance, safely demonstrate the use of tools to gather data and extend the senses, such as thermometers, hand lenses and balances.		
Student Friendly/"I Can..." Statement 1. Describe how tools help gather data. 2. Demonstrate the safe way to use thermometers. 3. Demonstrate the safe way to use handlenses. 4. Demonstrate the safe way to use balances.	Resources	Assessments
LOCAL AND GLOBAL ENVIRONMENTAL ISSUES		
S:ESS4:2:3.1 Differentiate between natural and man-made materials.		
Student Friendly/"I Can..." Statement 1. Describe manmade materials. 2. Describe natural materials. 3. Compare and contrast between natural and manmade materials.	Resources	Assessments
S:ESS4:2:3.2 Identify environments that are natural, such as a forest, meadow, or mountains and those that have been built or modified by people, including cities, roads, farms, and houses.		
Student Friendly/"I Can..." Statement 1. Describe natural environments. 2. Describe man-made or modified environments. 3. Compare and contrast natural environments with man-made environments.	Resources	Assessments
S:ESS4:2:3.3 Describe actions that can help the environment, such as recycling and proper disposal of waste materials.		
Student Friendly/"I Can..." Statement 1. Describe actions that help the environment. 2. Define recycling. 3. Define proper waste disposal.	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:ESS4:2:4.1 Recognize that some jobs/careers require knowledge and use of Earth science content and/or skills.		
Student Friendly/"I Can..." Statement 1. Identify jobs/careers that use knowledge of Earth science.	Resources	Assessments

2. Identify jobs/careers that use Earth science skills.		
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Life Science

LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

CLASSIFICATION		
S:LS1:2:1.1 Differentiate between living and nonliving things; and categorize objects in each group using the significant observable characteristics they share, such as color, shape and size.		
Student Friendly/"I Can..." Statement 1. Define living and nonliving. 2. Identify living things. 3. Identify nonliving things. 4. Categorize living things by color, shape and size. 5. Categorize nonliving things by color shape and size. 6. Compare and contrast the categories of living and nonliving items.	Resources	Assessments
S:LS1:2:1.2 Recognize plants and animals as living things and describe how they are alike and different.		
Student Friendly/"I Can..." Statement 1. Describe plants. 2. Describe animals. 3. Compare and contrast plants and animals.	Resources	Assessments
LIVING THINGS AND ORGANIZATION		
S:LS1:2:2.1 Recognize that plants and animals have features that help them survive in different environments.		
Student Friendly/"I Can..." Statement 1. Define features. 2. Define survival. 3. Tell how plants survive in different environments. 4. Tell how animals survive in different environments. 5. Compare and contrast plants and animals in the same environment.	Resources	Assessments
REPRODUCTION		
S:LS1:2:3.1 Recognize that parents and offspring of many species closely resemble one another; and describe the similarities in appearance of given plant and animal families.		
Student Friendly/"I Can..." Statement 1. Define parents.	Resources	Assessments

<ol style="list-style-type: none"> 2. Define offspring. 3. Observe how offspring resemble parents. 4. Observe that traits apply to both plant and animal families. 		
<p>S:LS1:2:3.2 Recognize that living things have a life cycle, during which they are born, grow, and die.</p>		
<p style="text-align: center;">Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Define life cycle. 2. Describe life cycles of living things. 	<p style="text-align: center;">Resources</p>	<p style="text-align: center;">Assessments</p>

LS2– Energy flows and matter recycles through an ecosystem.

ENVIRONMENT		
S:LS2:2:1.1 Recognize that living things can be found almost anyplace in the world; and that specific types of environments are required to support the many different species of plant and animal life.		
Student Friendly/"I Can..." Statement 1. Recognize that living things can be found almost anyplace in the world. 2. Identify specific types of environments. 3. Identify different species live in different environments.	Resources	Assessments
S:LS2:2:1.2 Recognize that animals, including humans, interact with their surroundings using their senses; and that different senses provide different kinds of information.		
Student Friendly/"I Can..." Statement 1. Recognize that animals react to environments with senses. 2. Identify the information each of the senses provide.	Resources	Assessments
S:LS2:2:1.3 Recognize that some plants and animals go through changes in appearance when the seasons change.		
Student Friendly/"I Can..." Statement 1. Identify how plants change with the seasons. 2. Identify how animals change with the seasons. 3. Identify some animals and plants do not change with the seasons.	Resources	Assessments
FLOW OF ENERGY		
S:LS2:2:2.1 Identify the resources plants and animals need for growth and energy, and describe how their habitat provides these basic needs.		
Student Friendly/"I Can..." Statement 1. Identify what plants need to grow. 2. Identify what animals need to grow. 3. Identify what plants need for energy. 4. Identify what animals need for energy. 5. Describe how habitats provide needs to plants and animals.	Resources	Assessments

LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry).

CHANGE		
S:LS3:2:1.1 Recognize that some living things, which lived on Earth long ago, are now extinct, such as dinosaurs, mammoths, giant tree ferns, and horsetail trees.		
Student Friendly/"I Can..." Statement 1. Define extinct. 2. Identify extinct living things. 3. Identify evidence of living things.	Resources	Assessments
EVIDENCE OF EVOLUTION		
S:LS3:2:2.1 Recognize that some plants and animals, which are alive today, are similar to living things which have become extinct, such as elephants and mammoths.		
Student Friendly/"I Can..." Statement 1. Compare and contrast extinct living things with current living things.	Resources	Assessments
NATURAL SELECTION		
S:LS3:2:3.1 Recognize and describe the similarities and differences in both behavior and appearance of plants and animals.		
Student Friendly/"I Can..." Statement 1. Define behavior. 2. Define appearance. 3. Describe behavior of plants. 4. Describe behaviors of animals. 5. Describe appearance of plants. 6. Describe appearance of animals. 7. Compare and contrast the behaviors of plants and animals. 8. Compare and contrast the appearance of plants and animals.	Resources	Assessments
S:LS3:2:3.2 Recognize that there are different species of living things in various places around the world.		
Student Friendly/"I Can..." Statement 1. Identify various places around the world. 2. Identify different species of living things around the world. 3. Describe how the various places are necessary for the different species.	Resources	Assessments

LS4– Humans are similar to other species in many ways, and yet are unique among Earth’s life forms.

BEHAVIOR		
S:LS4:2:1.1 Recognize and describe how living things respond when exposed to helpful and harmful situations.		
Student Friendly/"I Can..." Statement 1. Describe harmful situations. 2. Describe helpful situations. 3. Describe how living things respond to helpful situations. 4. Describe how living things respond to harmful situations.	Resources	Assessments
S:LS4:2:1.2 Recognize that humans learn from each other in many different ways, such as listening and speaking, watching and imitating.		
Student Friendly/"I Can..." Statement 1. Identify the ways humans learn from others.	Resources	Assessments
S:LS4:2:1.3 Recognize that humans can gather different kinds of information about an object by adjusting their proximity to it.		
Student Friendly/"I Can..." Statement 1. Record information about objects at varying distances from objects. 2. Compare information recorded at varying distances.	Resources	Assessments
S:LS4:2:1.4 Recognize that some of the things humans can do, such as playing games, reading, and writing, must be learned.		
Student Friendly/"I Can..." Statement 1. Describe things humans learn to do. 2. Describe things humans do without having to learn them (seeing, tasting, etc.)	Resources	Assessments
DISEASE		
S:LS4:2:2.1 Recognize that proper nutrition, exercise and rest are all important factors in maintaining good health.		
Student Friendly/"I Can..." Statement 1. Define nutrition. 2. Define exercise. 3. Define rest. 4. Describe how nutrition, exercise and rest are factors in maintaining health.	Resources	Assessments
S:LS4:2:2.2 Recognize that humans can spread germs that cause disease.		
Student Friendly/"I Can..." Statement 1. Define germs. 2. Define disease.	Resources	Assessments

3. Identify how humans spread germs and disease.		
S:LS4:2.2.3 Identify and describe the basic personal hygiene habits for maintaining good health, such as washing one's hands with soap and water and brushing one's teeth.		
Student Friendly/"I Can..." Statement 1. Identify hygiene habits. 2. Describe how good hygiene is important for good health.	Resources	Assessments
S:LS4:2.2.4 Recognize symptoms, such as fever, rashes, coughing and congestion for common illnesses.		
Student Friendly/"I Can..." Statement 1. Define fever. 2. Define rashes. 3. Define coughing. 4. Define congestion. 5. Identify common illnesses. 6. Identify symptoms of common illnesses.	Resources	Assessments
HUMAN IDENTITY		
S:LS4:2.3.1 Recognize similarities and individual differences among people, and that children closely resemble their parents.		
Student Friendly/"I Can..." Statement 1. Compare and contrast individual differences. 2. Compare and contrast differences of parents and children.	Resources	Assessments
S:LS4:2.3.2 Identify the sense organs, including eyes, ears, nose mouth, and skin; and describe how each can warn an individual about danger.		
Student Friendly/"I Can..." Statement 1. Identify sense organs. 2. Describe how information from sense organs warn of danger.	Resources	Assessments
S:LS4:2.3.3 Recognize that two parents, both a father and mother, are required for human reproduction.		
Student Friendly/"I Can..." Statement 1. Recognize that both genders are necessary for human reproduction.	Resources	Assessments
S:LS4:2.3.4 Recognize and describe the human life cycle from birth to old age.		
Student Friendly/"I Can..." Statement 1. Describe human life cycle.	Resources	Assessments
S:LS4:2.3.5 Recognize that humans need food, water, air, waste removal and a particular range of temperatures in their environment, just as other animals do.		

Student Friendly/"I Can..." Statement	Resources	Assessments
<ol style="list-style-type: none">1. Identify the things that animals need to survive.2. Identify the things humans need to survive.3. Compare and contrast the things animals need with the things humans need to survive.4. Recognize that humans are just like other animals with what they need to survive.		

LS5– The growth of scientific knowledge in Life Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues

DESIGN TECHNOLOGY		
S:LS5:2:1.1 Recognize that new products can be made out of natural materials, such as paper from trees and cloth from various plants and animals.		
Student Friendly/"I Can..." Statement 1. Identify the products that can be made from natural materials.	Resources	Assessments
TOOLS		
S:LS5:2:2.1 Recognize that some tools, such as magnifiers, balances and thermometers, have special uses and can help gather information and extend the senses.		
Student Friendly/"I Can..." Statement 1. Identify tools that have special uses and help gather information. 2. Identify tools that have special uses and extend the senses. 3. Compare and contrast the tools that help gather information and the tools that extend the senses.	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
MEDICAL TECHNOLOGY		
BIOTECHNOLOGY		
S:LS5:2:3.1 Recognize that technology is used in medicine to prevent and cure diseases through vaccinations and medications.		
Student Friendly/"I Can..." Statement 1. Identify the technology used in medicine to prevent diseases. 2. Identify the technologies used to cure diseases. 3. Identify the technologies used in vaccinations. 4. Identify the technologies used in medications.	Resources	Assessments
S:LS5:2:3.2 Provide examples from personal experience that illustrate how medicine helps humans recover from illness.		
Student Friendly/"I Can..." Statement 1. Give example of how medicine helped personally in recovering from an illness.	Resources	Assessments

CAREER TECHNICAL EDUCATION CONNECTIONS		
S:LS5:2:4.1 Recognize that some jobs/careers require knowledge and use of life science content and/or skills.		
Student Friendly/"I Can..." Statement 1. Identify jobs and careers that require knowledge of life science. 2. Identify jobs and careers that require skills acquired through knowledge of life sciences.	Resources	Assessments

Physical Science

PS1– All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size/amount of substance).

COMPOSITION		
S:PS1:2:1.1 Recognize that objects can be composed of different types of materials, such as wood, metal, and paper.		
Student Friendly/"I Can..." Statement 1. Identify objects made of wood. 2. Identify objects made of metal. 3. Identify objects made of paper.	Resources	Assessments
S:PS1:2:1.2 Recognize that objects can be made of one or more materials.		
Student Friendly/"I Can..." Statement 1. Identify objects made of more than one material.	Resources	Assessments
PROPERTIES		
S:PS1:2:2.1 Identify the observable properties of different objects, such as color, size, shape, weight and texture.		
Student Friendly/"I Can..." Statement 1. Define properties. 2. Define observations. 3. Identify objects based on color. 4. Identify objects based on size. 5. Identify objects based on shape. 6. Identify objects based on weight. 7. Identify objects based on texture. 8. Discuss how objects can have similar properties.	Resources	Assessments

PS2– Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.

CHANGE		
S:PS2:2:1.1 Describe how the properties of certain materials can change when specific actions are applied to them, such as freezing, mixing, heating, cutting, dissolving and bending.		
<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Define change. 2. Identify properties that change when material is frozen. 3. Identify properties of materials that change when material is mixed. 4. Identify properties of materials that change when material is heated. 5. Identify properties of materials that change when material is cut. 6. Identify properties of materials that change when material is dissolved. 7. Identify properties of materials that change when material is bent. 8. Describe what happens to properties when frozen. 9. Describe what happens to properties when mixed. 10. Describe what happens to properties when heated. 11. Describe what happens to properties when cut. 12. Describe what happens to properties when dissolved. 13. Describe what happens to properties when bent. 	Resources	Assessments
S:PS2:2:1.2 Recognize that not all materials react the same way when an action is applied to them.		
<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Compare and contrast the materials that were frozen. 2. Compare and contrast the materials that were mixed. 3. Compare and contrast the materials that 	Resources	Assessments

<p>were heated.</p> <p>4. Compare and contrast the materials that were cut.</p> <p>5. Compare and contrast the materials that were dissolved.</p> <p>6. Compare and contrast the materials that were bent.</p>		
ENERGY		
S:PS2:2:3.1 Recognize that sound is produced by vibrating objects and that the pitch of the sound can be varied by changing the rate of vibration.		
<p>Student Friendly/"I Can..." Statement</p> <p>1. Define sound.</p> <p>2. Define vibration.</p> <p>3. Define pitch.</p> <p>4. Define changing rate.</p> <p>5. Identify objects that produce a sound when vibrated.</p> <p>6. Identify that the pitch changes when the rate of vibration changes.</p>	Resources	Assessments
S:PS2:2:3.2 Explain that the Sun provides the Earth with heat and light.		
<p>Student Friendly/"I Can..." Statement</p> <p>1. Identify what the Sun provides the Earth.</p>	Resources	Assessments
S:PS2:2:3.3 Describe that heat can be produced in a variety of ways, such as burning, rubbing, and mixing substances together.		
<p>Student Friendly/"I Can..." Statement</p> <p>1. Identify the various ways heat can be produced.</p> <p>2. Compare and contrast the various ways heat can be produced.</p>	Resources	Assessments
S:PS2:2:3.4 Recognize that energy comes from different sources, such as electricity and water, and is utilized in many common objects.		
<p>Student Friendly/"I Can..." Statement</p> <p>1. Identify the different sources from which energy is produced.</p> <p>2. Identify the ways energy is used.</p>	Resources	Assessments

PS3– The motion of an object is affected by force.

FORCES		
S:PS3:2:1.1 Describe the properties of magnetism and demonstrate how magnets can be used to move some things without touching them.		
Student Friendly/"I Can..." Statement 1. Define magnetism. 2. Show how magnets can move things without touching them.	Resources	Assessments
S:PS3:2:1.2 Describe and demonstrate that things close to the Earth drop to the ground unless something supports them.		
Student Friendly/"I Can..." Statement 1. Define gravity. 2. Demonstrate how gravity works on objects.	Resources	Assessments
MOTION		
S:PS3:2:2.1 Describe the many different ways things can move, such as in a straight line, zigzag or circular motion, back and forth, and fast and slow.		
Student Friendly/"I Can..." Statement 1. Identify the ways in which things move.	Resources	Assessments
S:PS3:2:2.2 Describe and demonstrate how the position and motion of an object can be changed by applying force, such as pushing and pulling; and explain that the greater the force, the greater the change.		
Student Friendly/"I Can..." Statement 1. Define position. 2. Define motion. 3. Define force. 4. Identify the ways in which the movement of an object changes. 5. Identify the force that changed to movement of the object. 6. Describe the how the magnitude of the force changes the movement of the oject.	Resources	Assessments
S:PS3:2:2.3 Describe the position of an object by referencing its location in relation to another object or background.		
Student Friendly/"I Can..." Statement 1. Define location. 2. Define reference. 3. Define background. 4. Describe position of an object in reference to another object or background.	Resources	Assessments

PS4– The growth of scientific knowledge in Physical Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:PS4:2:1.1 Recognize that new objects can be made out of physical materials, such as cloth and paper.		
Student Friendly/"I Can..." Statement 1. Identify new objects made from cloth. 2. Identify new objects made from paper.	Resources	Assessments
TOOLS		
S:PS4:2:2.1 Identify tools and simple machines, such as a wheel, and explain how they work.		
Student Friendly/"I Can..." Statement 1. Define tools. 2. Define simple machines. 3. Identify tools and simple machines. 4. Explain how tools and simple machines work.	Resources	Assessments
S:PS4:2:2.2 Demonstrate how to use tools, such as rulers, scales, balances, magnifiers and thermometers to measure properties of objects, such as size, weight, temperature.		
Student Friendly/"I Can..." Statement 1. Identify the appropriate tools to use to measure a specific property. 2. Describe how each tool measures a different property.	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
ENERGY, POWER, AND TRANSPORTATION		
MANUFACTURING		
S:PS4:2:3.1 Provide examples of how man uses energy in everyday life, such as providing light, warmth in winter, cooling in summer, TVs, computers, telephones, transportation, factories.		
Student Friendly/"I Can..." Statement 1. Give examples on how man uses energy. 2. Describe the energy each example uses.	Resources	Assessments
S:PS4:2:3.2 Provide examples of items that are manufactured or produced.		
Student Friendly/"I Can..." Statement 1. Give examples of items that are	Resources	Assessments

manufactured. 2. Give examples of items that are produced. 3. Compare and contrast the examples manufactured with those produced.		
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:PS4:2:4.1 Recognize that some jobs/careers require knowledge and use of physical science content and/or skills.		
Student Friendly/"I Can..." Statement 1. Identify jobs and careers that require knowledge of physical science. 2. Identify jobs and careers that require skills learned while engaged in physical science exploration.	Resources	Assessments

3 – 4

Process Skills

Scientific Inquiry and Critical thinking Skills

MAKING OBSERVATIONS AND ASKING QUESTIONS		
S:SPS1:4:1.1 Extend the senses using simple tools.		
Student Friendly/"I Can..." Statement 1. Explain how simple tools extend the senses. 2. Use simple tools in exploration.	Resources	Assessments
S:SPS1:4:1.2 Make and record observations for a given purpose.		
Student Friendly/"I Can..." Statement 1. Define observations. 2. Define purpose. 3. Identify purpose for observations. 4. Record observations.	Resources	Assessments
S:SPS1:4:1.3 Differentiate between observations and inferences.		
Student Friendly/"I Can..." Statement 1. Define inference. 2. Recall what observation is. 3. Give examples of inferences. 4. Give examples of observations. 5. Compare and contrast observations and inferences.	Resources	Assessments
S:SPS1:4:1.4 Record observations using standard units of measurement.		
Student Friendly/"I Can..." Statement 1. Define standard units of measurement. 2. Record observations using standard units of measurement.	Resources	Assessments
S:SPS1:4:1.5 Classify according to several attributes and describe or show the method for classification.		
Student Friendly/"I Can..." Statement 1. Define attributes. 2. Define classification. 3. Classify objects according to attributes. 4. Explain method of classification.	Resources	Assessments
S:SPS1:4:1.6 Compare methods of classifying based on the goal.		
Student Friendly/"I Can..." Statement 1. Define goal.	Resources	Assessments

2. Compare classifying object by goal versus by attribute.		
3. Describe how classification changes with goals.		
S:SPS1:4:1.7 Ask questions about objects, organisms and events in their local environment.		
Student Friendly/"I Can..." Statement	Resources	Assessments
1. Develop questions about objects in the environment.		
2. Develop questions about organisms in local environment.		
3. Develop questions about events in local environment.		
4. Record results of asking questions.		
S:SPS1:4:1.8 Pose questions to investigate and practical problems to solve.		
Student Friendly/"I Can..." Statement	Resources	Assessments
1. Identify practical problems.		
2. Pose questions to investigate problems.		
3. Pose questions to solve problems.		
DESIGNING SCIENTIFIC INVESTIGATIONS		
S:SPS1:4:2.1 Plan a step-by-step process to solve a practical problem or to carry out a "fair test" of a simple scientific question.		
Student Friendly/"I Can..." Statement	Resources	Assessments
1. Identify a plan to solve problems.		
2. Organize plan into steps.		
3. Identify fair test of scientific questions.		
4. Organize fair test into steps.		
S:SPS1:4:2.2 Select an activity and justify it as an effective means of collecting appropriate data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
1. Select an activity to collect appropriate data.		
2. Justify the effectiveness of the activity to collect appropriate data.		
CONDUCTING SCIENTIFIC INVESTIGATIONS		
S:SPS1:4:3.1 Follow a set of procedures.		
Student Friendly/"I Can..." Statement	Resources	Assessments
1. Identify procedures.		
2. Follow procedures.		
S:SPS1:4:3.2 Plan and test ideas through guided experiments.		
Student Friendly/"I Can..." Statement	Resources	Assessments
1. Plan a guided experiment.		
2. Test ideas in a guided experiment.		

S:SPS1:4:3.3 Identify and use appropriate tools.		
Student Friendly/"I Can..." Statement 1. Identify the use of appropriate tools for the experiment. 2. Use the tools appropriately.	Resources	Assessments
REPRESENTING AND UNDERSTANDING RESULTS OF INVESTIGATIONS		
S:SPS1:4:4.1 Compile and display data in a variety of formats.		
Student Friendly/"I Can..." Statement 1. Collect data. 2. Organize data. 3. Display data in a variety of formats.	Resources	Assessments
S:SPS1:4:4.2 Select an appropriate format to represent data or observations.		
Student Friendly/"I Can..." Statement 1. Choose an appropriate format for representing data. 2. Explain why choice was appropriate for the data.	Resources	Assessments
S:SPS1:4:4.3 Identify and suggest possible explanations for patterns.		
Student Friendly/"I Can..." Statement 1. Identify patterns in data. 2. Suggest possible explanations for the patterns in the data.	Resources	Assessments
S:SPS1:4:4.4 Analyze data and identify discrepancies.		
Student Friendly/"I Can..." Statement 1. Analyze data with gaps, outliers, etc. 2. Identify any discrepancies in the data.	Resources	Assessments
EVALUATING SCIENTIFIC EXPLANATIONS		
S:SPS1:4:5.1 Cite evidence or data to support conclusions.		
Student Friendly/"I Can..." Statement 1. Using the information from the data, refer to the evidence o support conclusions.	Resources	Assessments
S:SPS1:4:5.2 Determine if an observation or measurement supports a given scientific explanation.		
Student Friendly/"I Can..." Statement 1. Determine if an observation supports the explanation. 2. Determine if the measurement supports the	Resources	Assessments

<p>explanation.</p> <p>3. Determine if the explanation is based on scientific evidence.</p>		
<p>S:SPS1:4:5.3 Draw a conclusion to answer an initial question, based on the evidence collected.</p>		
<p>Student Friendly/"I Can..." Statement</p> <p>1. Write a conclusion to the experiment or investigation.</p> <p>2. Determine if the conclusion is based on the evidence collected.</p> <p>3. Rewrite conclusion to include specific evidence cited.</p>	<p>Resources</p>	<p>Assessments</p>

Unifying Concepts of Science

NATURE OF SCIENCE (NOS)

S:SPS2:4:1.1 Recognize that sometimes scientists have different explanations for the same set of observations which usually lead them to make more observations to resolve the differences.

<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Identify explanations from different scientists that differ. 2. Explain how differences are resolved. 	Resources	Assessments
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S:SPS2:4:1.2 Realize that results of similar scientific investigations seldom turn out exactly the same, but if the differences are large it's important to try to figure out why

<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Identify similar scientific investigations. 2. Check the results of the similar investigations. 3. Explain why comparison of results is important. 	Resources	Assessments
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S:SPS2:4:1.3 Know when comparisons might not be fair because some conditions are not kept the same.

<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Explain how comparisons can differ. 2. Explain how if conditions are not the same that the comparison may not be fair. 	Resources	Assessments
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S:SPS2:4:1.4 Explain that scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments; and that investigations can focus on physical, biological, and social questions.

<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Identify different forms of scientific investigations. 2. Identify different methods of observations. 3. Identify different types of problems being investigated. 	Resources	Assessments
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S:SPS2:4:1.5 Realize that scientists' explanations about what happens in the world come partly from what they observe, and partly from what they think.

<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Identify the observations in an experiment or investigations. 2. Identify opinion or what the scientists think in the explanation of the investigation. 	Resources	Assessments
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SYSTEMS AND ENERGY (SAE)

S:SPS2:4:2.1 Demonstrate that if something consists of many parts, the parts usually influence one another.

<p>Student Friendly/"I Can..." Statement</p> <ol style="list-style-type: none"> 1. Explain how the parts of a whole influence 	Resources	Assessments
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each other. 2. Show how the parts of a whole influence each of the parts.		
S:SPS2:4:2.2 Provide examples that demonstrate that something may not work well (or at all) if a part of it is missing, broken, worn out, mismatched, or misconnected.		
Student Friendly/"I Can..." Statement 1. Give example of something that doesn't work right if a part is missing. 2. Give example of something that doesn't work right if a part is broken. 3. Give example of something that doesn't work right if a part is worn out. 4. Give example of something that doesn't work right if a part is mismatched. 5. Give example of something that doesn't work right if a part is misconnected.	Resources	Assessments
MODELS AND SCALE (MAS)		
S:SPS2:4:3.1 Know that seeing how a model works after changes are made to it may suggest how the real thing would work if the same changes were done to it		
Student Friendly/"I Can..." Statement 1. Describe how models are related to real life object. 2. Describe how changing the model and describing how the change affects the model suggests how the same change would effect the real thing.	Resources	Assessments
S:SPS2:4:3.2 Use geometric figures, number sequences, graphs, diagrams, and pictures as scientific models.		
Student Friendly/"I Can..." Statement 1. Use geometric figures as a scientific model. 2. Use number sequences as a scientific model. 3. Use graphs as a scientific model. 4. Use diagrams as a scientific model. 5. Use pictures as a scientific model.	Resources	Assessments
S:SPS2:4:3.3 Recognize that most everything has limits on how big or small it can be.		
Student Friendly/"I Can..." Statement 1. Describe how sizes of things can be limited.	Resources	Assessments

PATTERNS OF CHANGE (POC)		
S:SPS2:4:4.1 Observe that some small changes can be detected by taking measurements.		
Student Friendly/"I Can..." Statement 1. Describe small changes in measurement. 2. Describe how to record small changes.	Resources	Assessments
S:SPS2:4:4.2 Understand that some changes are so slow or so fast that they are hard to see.		
Student Friendly/"I Can..." Statement 1. Identify changes that are very slow. 2. Identify changes that are very fast. 3. Explain that those changes are measured by measurements other than human eye observation.	Resources	Assessments
S:SPS2:4:4.3 Demonstrate that some features of things may stay the same even when other features change (e.g., some patterns look the same when they are shifted over, turned, reflected, or seen from different directions).		
Student Friendly/"I Can..." Statement 1. Explain what features change. 2. Explain which feature stay the same.	Resources	Assessments
FORM AND FUNCTION (FAF)		
S:SPS2:4:5.1 Discover the relationship between shape and use.		
Student Friendly/"I Can..." Statement 1. Define relationship. 2. Define shape. 3. Define use. 4. Explain how shape and use are related.	Resources	Assessments
S:SPS2:4:5.2 Explore methods, designs and problems of transporting liquids.		
Student Friendly/"I Can..." Statement 1. Identify methods of transporting liquids. 2. Identify designs of transporting liquids. 3. Identify problems in transporting liquids.	Resources	Assessments

Personal, Social, and Technological Perspectives

COLLABORATION IN SCIENTIFIC ENDEAVORS

S:SPS3:4:1.1 Be able to complete an assigned task when given a specific role in a group.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:SPS3:4:1.2 Communicate ideas to others.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:SPS3:4:1.3 Give specific feedback about work of others.

Student Friendly/"I Can..." Statement	Resources	Assessments
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COMMON ENVIRONMENTAL ISSUES, NATURAL RESOURCES MANAGEMENT AND CONSERVATION

S:SPS3:4:2.1 Demonstrate a basic conservation action such as recycling or a schoolyard habitat project.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:SPS3:4:2.2 Develop questions based upon their observations about the natural world and design a simple investigation.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:SPS3:4:2.3 Develop questions that help them learn about the environment; and design and conduct simple investigations

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:SPS3:4:2.4 Locate and collect information about the environment and environmental and natural resources topics.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:SPS3:4:2.5 Use reliable information to answer questions.

Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:4:2.6 Organize information to search for relationships and patterns concerning the environment and environmental topics.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:4:2.7 Identify and investigate issues in their local environments and communities.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SCIENCE AND TECHNOLOGY, TECHNOLOGICAL DESIGN AND APPLICATION		
S:SPS3:4:3.1 Describe the design process as a logical progression for transforming ideas into reality.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:4:3.2 Describe how people have designed and used tools throughout history; and provide examples of how many of these tools, while improved, are still in use today.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:4:3.3 Provide examples illustrating that throughout history, people of all ages and from all walks of life have made significant contributions to the fields of science and technology.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Science Skills for Information, Communication and Media Literacy

INFORMATION AND MEDIA LITERACY		
S:SPS4:4:1.1 Access information from a variety of media sources (e.g., Internet, CD-ROM programs, print resources).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:1.2 Use appropriate tools to measure and graph data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:1.3 Analyze and compare data from a variety of age-appropriate sources such as newspapers and websites.		
Student Friendly/"I Can..." Statement	Resources	Assessments
COMMUNICATION SKILLS		
S:SPS4:4:2.1 Use a variety of tools and formats (oral presentations, journals, and multimedia presentations) to summarize and communicate the results of observations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CRITICAL THINKING AND SYSTEMS THINKING		
S:SPS4:4:3.1 Apply a variety of age-appropriate strategies to address real-life issues (e.g., identify factors that affect plants in a particular habitat).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:3.2 Build a concept map (or other graphic organizer) to understand a complex problem.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:3.3 Organize observations and data into tables, charts and graphs.		
Student Friendly/"I Can..." Statement	Resources	Assessments

PROBLEM IDENTIFICATION, FORMULATION, AND SOLUTION		
S:SPS4:4:4.1 Ask questions and plan investigations to find answers.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:4.2 Compile data gathered through observations to record and present results using tally charts, tables and graphs.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:4.3 Use evidence to construct explanations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CREATIVITY AND INTELLECTUAL CURIOSITY		
S:SPS4:4:5.1 Use a variety of equipment and software packages to enter, process, display, and/or communicate information in different forms using text, tables, pictures, and sound (e.g., brainstorming software, collaboration software, telecommunications, presentation software, digital cameras, projectors).		
Student Friendly/"I Can..." Statement	Resources	Assessments
INTERPERSONAL AND COLLABORATIVE SKILLS		
S:SPS4:4:6.1 Plan and conduct a scientific investigation in group settings.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:6.2 Engage in group decision making activities		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:4:6.3 Role-play different points of view on an issue.		
Student Friendly/"I Can..." Statement	Resources	Assessments

SELF DIRECTION		
S:SPS4:4:7.1 Keep a journal record of observations, recognizing patterns, summarizing findings, and reflecting on the observations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
ACCOUNTABILITY AND ADAPTABILITY		
S:SPS4:4:8.1 Establish ongoing communication with students from other communities or countries to share and compare data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOCIAL RESPONSIBILITY		
S:SPS4:4:9.1 Collaborate with other learners by letter, phone, or online.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Earth Space Science

ESS1– The Earth and Earth materials, as we know them today, have developed over long periods of time, through constant change processes.

ATMOSPHERE, CLIMATE, AND WEATHER		
S:ESS1:4:1.1 Explain how water exists in the atmosphere in different forms and describe how it changes from one form to another through various processes such as freezing, condensation, precipitation and evaporation.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:1.2 Explain that air surrounds the Earth, it takes up space, and it moves around as wind.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:1.3 Based on data collected from daily weather observations, describe weather changes or weather patterns.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:1.4 Explain how the use of scientific tools helps to extend senses and gather data about weather (i.e., weather/wind vane– direction; wind sock– wind intensity; anemometer– speed; thermometer– temperature; meter sticks/rulers– snow depth; rain gauges– rain amount in inches).		
Student Friendly/I Can... Statement	Resources	Assessments
COMPOSITION AND FEATURES		
S:ESS1:4:2.1 Describe Earth materials such as gases found in the atmosphere, rocks, soils, and water in its liquid and solid states.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:2.2 Describe rock as being composed of different combinations of minerals.		
Student Friendly/I Can... Statement	Resources	Assessments

S:ESS1:4:2.3 Given information about Earth materials, explain how their characteristics lend themselves to specific uses.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:2.4 Given certain Earth materials (soils, rocks, or minerals) use physical properties to sort, classify, and/or describe them.		
Student Friendly/I Can... Statement	Resources	Assessments
FOSSILS		
S:ESS1:4:3.1 Recognize and explain that fossils offer evidence of plants, animals and the nature of environments that existed long ago.		
Student Friendly/I Can... Statement	Resources	Assessments
OBSERVATION OF THE EARTH FROM SPACE		
S:ESS1:4:4.1 Recognize features of the Earth as viewed by astronauts in orbit and as transmitted by scientific instruments on satellites and spacecraft.		
Student Friendly/I Can... Statement	Resources	Assessments
PROCESSES AND RATES OF CHANGE		
S:ESS1:4:5.1 Identify and describe processes that affect the features of the Earth's surface, including weathering, erosion, deposition of sediment.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:5.2 Explain how wind, water, or ice shape and reshape the Earth's surface.		
Student Friendly/I Can... Statement	Resources	Assessments
ROCK CYCLE		
S:ESS1:4:6.1 Explain that smaller rocks come from the breaking and weathering of larger rocks and bedrock.		
Student Friendly/I Can... Statement	Resources	Assessments

S:ESS1:4:6.2 Distinguish between the three categories of rocks (metamorphic, igneous and sedimentary) and describe the processes that create them.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:6.3 Identify minerals by their physical properties, such as color, texture and cleavage, and describe simple tests used in the identification process.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:6.4 Use results from an experiment to draw conclusions about how water interacts with earth materials (e.g., percolation, erosion, frost heaves).		
Student Friendly/I Can... Statement	Resources	Assessments
WATER		
S:ESS1:4:7.1 Recognize and describe the Earth's surface as mostly covered by water.		
Student Friendly/I Can... Statement	Resources	Assessments
S:ESS1:4:7.2 Explain that most of Earth's water is salt water, which is found in the oceans, and that fresh water is found in rivers, lakes, underground sources, and glaciers.		
Student Friendly/I Can... Statement	Resources	Assessments

ESS2– The Earth is part of a solar system, made up of distinct parts, which have temporal and spatial interrelationships.

EARTH, SUN, AND MOON		
S:ESS2:4:1.1 Explain that night and day are caused by the Earth’s rotation on its axis; and that the Earth rotates approximately once, every 24 hours.		
Student Friendly/”I Can...” Statement	Resources	Assessments
S:ESS2:4:1.2 Describe the Sun as a star.		
Student Friendly/”I Can...” Statement	Resources	Assessments
ENERGY		
S:ESS2:4:2.1 Recognize that the Sun provides the light and heat necessary to maintain the temperature of the Earth.		
Student Friendly/”I Can...” Statement	Resources	Assessments
SOLAR SYSTEM		
S:ESS2:4:3.1 Recognize that the Moon orbits the Earth.		
Student Friendly/”I Can...” Statement	Resources	Assessments
S:ESS2:4:3.2 Recognize that the Earth is one of a number of planets that orbit the Sun.		
Student Friendly/”I Can...” Statement	Resources	Assessments
VIEW FROM EARTH		
S:ESS2:4:4.1 Recognize that although star patterns seen in the sky appear to move slowly each night from east to west they actually remain the same, and explain why different stars can be seen during different seasons.		
Student Friendly/”I Can...” Statement	Resources	Assessments
S:ESS2:4:4.2 Explain why the planets look like stars, and why, over a period of time, they appear to wander among the constellations.		

Student Friendly/"I Can..." Statement	Resources	Assessments
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ESS3– The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time.

SIZE AND SCALE		
S:ESS3:4:1.1 Recognize that astronomical objects in space are massive in size and are separated from one another by vast distances.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:4:1.2 Explain that telescopes magnify the size of distant objects and significantly increase the number of these objects that can be viewed from Earth.		
Student Friendly/"I Can..." Statement	Resources	Assessments
STARS AND GALAXIES		
S:ESS3:4:2.1 Recognize and describe the stars, like the Sun, as spherical in nature.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:4:2.2 Recognize that stars come in different colors, and that the Sun is a yellow star.		
Student Friendly/"I Can..." Statement	Resources	Assessments

ESS4– The growth of scientific knowledge in Earth Space Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:ESS4:4:1.1 Recognize that man uses various mechanical devices to record changes in the weather and the Earth.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:ESS4:4:2.1 Demonstrate the use of simple instruments to collect weather data, including thermometers, windsocks, meter sticks, and rain gauges.		
Student Friendly/"I Can..." Statement	Resources	Assessments
LOCAL AND GLOBAL ENVIRONMENTAL ISSUES		
S:ESS4:4:3.1 Distinguish between and provide examples of materials that can be recycled/reused and those that cannot.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:4:3.2 Provide examples of technology that have changed the environment and explain whether the effect had a positive or negative impact.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:4:3.3 Explain how to dispose of waste so that it does not harm the environment.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:4:3.4 Recognize there are pros and cons to using different types of energy, such as solar energy and fossil fuels, and compare the differences.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:ESS4:4:4.1 Identify some jobs/careers that require knowledge and use of Earth science content and/or skills.		

Student Friendly/"I Can..." Statement	Resources	Assessments
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Life Sciences

LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

CLASSIFICATION		
S:LS1:4:1.1 Recognize and identify the various ways in which living things can be grouped.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:4:1.2 Sort/classify different living things using similar and different characteristics; and describe why organisms belong to each group or cite evidence about how they are alike or not alike.		
Student Friendly/"I Can..." Statement	Resources	Assessments
LIVING THINGS AND ORGANIZATION		
S:LS1:4:2.1 Recognize that living organisms have certain structures and systems that perform specific functions, facilitating survival, growth and reproduction.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:4:2.2 Identify and describe the function of the plant structures responsible for food production, water transport, support, reproduction, growth and protection.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:4:2.3 Identify and explain how the physical structures of an organism (plants or animals) allow it to survive in its habitat/environment (e.g., roots for water; nose to smell fire).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:4:2.4 Identify the basic needs of plants and animals in order to stay alive (i.e., water, air, food, space).		
Student Friendly/"I Can..." Statement	Resources	Assessments

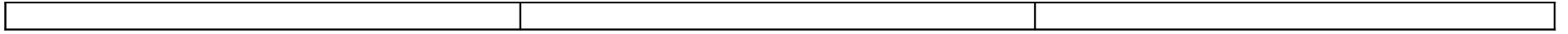
REPRODUCTION		
S:LS1:4:3.1 Distinguish between plant and animal characteristics that are inherited, such as eye color in humans and the shape of leaves in plants, and those that are affected by their environment, such as grass turning brown due to lack of water.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:4:3.2 Recognize that living organisms have life cycles, which include birth, growth and development, reproduction, and death; and explain how these life cycles vary for different organisms.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:4:3.3 Describe the reproductive process of plants, explaining some plants grow from seed, while others grow from the parts of other plants.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:4-3.4 Predict, sequence, or compare the life stages of organisms (plants and animals): e.g., put images of life stages of an organism in order, predict the next stage in sequence, and compare two organisms.		
Student Friendly/"I Can..." Statement	Resources	Assessments

LS2– Energy flows and matter recycles through an ecosystem.

ENVIRONMENT		
S:LS2:4:1.1 Describe how the nature of an organism’s environment, such as the availability of a food source, the quantity and variety of other species present, and the physical characteristics of the environment affect the organism’s patterns of behavior.		
Student Friendly/I Can... Statement	Resources	Assessments
S:LS2:4:1.2 Describe the interaction of living organisms with nonliving things.		
Student Friendly/I Can... Statement	Resources	Assessments
FLOW OF ENERGY		
S:LS2:4:2.1 Recognize that the transfer of energy through food is necessary for all living organisms and describe the organization of food webs.		
Student Friendly/I Can... Statement	Resources	Assessments
S:LS2:4:2.2 Recognize that energy is needed for all organisms to stay alive and grow or identify where a plant or animal gets its energy.		
Student Friendly/I Can... Statement	Resources	Assessments
RECYCLING OF MATERIALS		
S:LS2:4:3.1 Recognize that plants and animals interact with one another in various ways besides providing food, such as seed dispersal or pollination.		
Student Friendly/I Can... Statement	Resources	Assessments
S:LS2:4:3.2 Describe ways plants and animals depend on each other (e.g., shelter, nesting, food).		
Student Friendly/I Can... Statement	Resources	Assessments

LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry).

CHANGE		
S:LS3:4:1.1 Provide examples of how environmental changes can cause different effects on different organisms.		
Student Friendly/I Can... Statement	Resources	Assessments
S:LS3:4:1.2 Provide examples of how an organism’s inherited characteristics can adapt and change over time in response to changes in the environment.		
Student Friendly/I Can... Statement	Resources	Assessments
S:LS3:4:1.3 Using information (data or scenario), explain how changes in the environment can cause organisms to respond (e.g., survive there and reproduce, move away, die).		
Student Friendly/I Can... Statement	Resources	Assessments
EVIDENCE OF EVOLUTION		
S:LS3:4:2.1 Compare information about fossils to living organisms and other fossils to determine any similarities and differences.		
Student Friendly/I Can... Statement	Resources	Assessments
NATURAL SELECTION		
S:LS3:4:3.1 Recognize that individuals of the same species differ in their characteristics; and explain that sometimes these differences give individuals an advantage in survival and reproduction.		
Student Friendly/I Can... Statement	Resources	Assessments
S:LS3:4:3.2 Recognize that for any particular environment, some kinds of animals and plants survive well, some less well, and some cannot survive at all.		
Student Friendly/I Can... Statement	Resources	Assessments



LS4– Humans are similar to other species in many ways, and yet are unique among Earth’s life forms.

BEHAVIOR		
S:LS4:4:1.1 Recognize that an individual organism’s behavior is affected by internal cues, such as hunger and thirst; and describe how an organism uses its senses to understand and respond to these cues.		
Student Friendly”I Can...” Statement	Resources	Assessments
S:LS4:4:1.2 Recognize that an individual organism’s behavior is influenced by external cues, such as seasonal change; and describe how an organism might react, such as migrating or hibernating.		
Student Friendly”I Can...” Statement	Resources	Assessments
S:LS4:4:1.3 Recognize behaviors that may be unsafe or unhealthy for themselves and others.		
Student Friendly”I Can...” Statement	Resources	Assessments
DISEASE		
S:LS4:4:2.1 Explain how the amount of rest and the types of food, exercise and recreation humans choose can influence and affect their well-being.		
Student Friendly”I Can...” Statement	Resources	Assessments
S:LS4:4:2.2 Recognize that vitamins and minerals are needed in small amounts and are essential to maintain proper health.		
Student Friendly”I Can...” Statement	Resources	Assessments
S:LS4:4:2.3 Explain how proper food preparation and appropriate food handling practices can maintain the safety and quality of food.		
Student Friendly”I Can...” Statement	Resources	Assessments
HUMAN IDENTITY		
S:LS4:4:3.1 Identify what the physical structures of humans do (e.g., sense organs– eyes, ears, skin, etc.) or compare physical structures of humans to similar structures of animals.		

Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:4:3.2 Distinguish between characteristics of humans that are inherited from parents (i.e., hair color, height, skin color, eye color) and others that are learned (e.g., riding a bike, singing a song, playing a game, reading).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:4:3.3 Recognize the nutritional value of different foods and distinguish between healthy and unhealthy food choices using data gathered from food labels and dietary guidelines, such as the food pyramid.		
Student Friendly/"I Can..." Statement	Resources	Assessments

LS5– The growth of scientific knowledge in Life Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:LS5:4:1.1 Recognize that man uses various mechanical devices to record and describe living organisms.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:LS5:4:2.1 Demonstrate the use of appropriate tools and simple equipment, such as thermometers, magnifiers and microscopes to gather data and extend the senses.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:4:2.2 Identify and describe the purpose of tools used by health care professionals, such as X-rays and stethoscopes.		
SOCIAL ISSUES (LOCAL AND GLOBAL)		
MEDICAL TECHNOLOGY		
BIOTECHNOLOGY		
S:LS5:4:3.1 Recognize that medical technology provides information about a body's condition, such as determining blood pressure, and recognizing the need to repair, replace and support the affected body parts.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:4:3.2 Recognize that biotechnology refers to the different ways humans modify the living environment to meet their needs, including growing food, genetic engineering and using living organisms such as yeast to prepare foods.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:LS5:4:4.1 Identify some jobs/careers that require knowledge and use of life science content and/or skills.		
Student Friendly/"I Can..." Statement	Resources	Assessments

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Physical Science

PS1– All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size/amount of substance).

COMPOSITION		
S:PS1:4:1.1 Explain that materials may be composed of parts that are too small to be seen without magnification.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:4:1.2 Use measures of weight (data) to demonstrate that the whole equals the sum of its parts.		
Student Friendly/"I Can..." Statement	Resources	Assessments
PROPERTIES		
S:PS1:4:2.1 Recognize that substances can be classified by observable properties.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:4:2.2 Explain that some materials can exist in different states; and describe the distinct physical properties of each state of matter.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:4:2.3 Explain how some materials, such as water, can change from one state to another by heating or cooling.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:4:2.4 Make a prediction about what might happen to the state of common materials when heated or cooled; or categorize materials as solid, liquid, or gas.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:PS1:4:2.5 Collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility).

Student Friendly "I Can..." Statement	Resources	Assessments

PS2– Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.

CHANGE		
S:PS2:4:1.1 Recognize that energy has the ability to create change.		
Student Friendly/"I Can..." Statement	Resources	Assessments
ENERGY		
S:PS2:4:3.1 Identify the various forms of energy, such as electrical, light, heat, sound.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:4:3.2 Recognize that electricity in circuits can produce light, heat, sound, and magnetic effects.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:4:3.3 Identify and describe the organization of a simple circuit.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:4:3.4 Differentiate between objects and materials that conduct electricity and those that are insulators of electricity.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:4:3.5 Explain that light travels in a straight line until it strikes an object; and describe how it can be reflected by a mirror, bent by a lens, or absorbed by the object.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:4:3.6 Given a specific example or illustration (e.g., simple closed circuit, rubbing hands together) predict the observable effects of energy (i.e., the bulb lights, a bell rings, hands warm up). A test item may ask, "What will happen when...?"		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:PS2:4:3.7 Use observations of light in relation to other objects/substances to describe the properties of light (i.e., can be reflected, refracted, or absorbed).		
Student Friendly "I Can..." Statement	Resources	Assessments
S:PS2:4:3.8 Experiment, observe, or predict how heat might move from one object to another.		
Student Friendly "I Can..." Statement	Resources	Assessments

PS3– The motion of an object is affected by force.

FORCES		
S:PS3:4:1.1 Recognize that magnets attract certain kinds of other materials; and classify objects by those magnets will attract and those they will not.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS3:4:1.2 Recognize that magnets attract and repel each other.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS3:4:1.3 Explain that electrically charged material pulls on all other materials and can attract or repel other charged materials.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS3:4:1.4 Recognize that the Earth's gravitational force pulls any object toward it.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS3:4:1.5 Use observations of magnets in relation to other objects to describe the properties of magnetism (i.e., attract or repel certain objects or has no effect).		
Student Friendly/"I Can..." Statement	Resources	Assessments
MOTION		
S:PS3:4:2.1 Use data to predict how a change in force (greater/less) might affect the position, direction of motion, or speed of an object (e.g., ramps and balls).		
Student Friendly/"I Can..." Statement	Resources	Assessments

PS4– The growth of scientific knowledge in Physical Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:PS4:4:1.1 Understand that materials are used in certain products based on their properties, such as strength and flexibility.		
S:PS4:4:1.2 Recognize that products are made using a combination of technologies, such as how an escalator uses both a pulley system and an electrical motor.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:PS4:4:2.1 Demonstrate how to use tools, such as magnifiers, scales, balances, rulers, and thermometers to gather data and extend the senses.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS4:4:2.2 Describe how some tools can be used to modify natural materials by processes such as separating, shaping, and joining, to produce new materials.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
ENERGY, POWER, AND TRANSPORTATION		
MANUFACTURING		
S:PS4:4:3.1 Give examples of transportation systems used in New Hampshire, such as buses, trains, cars, and bicycles; and describe the sources of energy they use.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS4:4:3.2 Explain that manufactured products are designed to solve a problem or meet a need.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:PS4:4:3.3 Provide an example to illustrate that manufacturing involves changing natural materials into finished products; and explain that this results in the production of a large number of objects that look almost identical.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:PS4:4:4.1 Identify some jobs/careers that require knowledge and use of physical science content and/or skills.		
Student Friendly/"I Can..." Statement	Resources	Assessments

MIDDLE LEVEL SCIENCE – GRADES 5 to 8 STUDENTS IDENTIFY AND SHAPE THEIR UNDERSTANDING OF THE WORLD

Children in grades 5-8 will build on their K-4 measurement and observation skills to construct new understandings and validate scientific theories and explanations. At this level, effective learning environments provide opportunities for collaborative inquiry in the field, classroom, and laboratory. These students need content knowledge as well as frequent and varied practice in experimentation and inquiry. Since students in the middle years tend to center on evidence which supports their current beliefs, they need to be able to examine their beliefs and concepts in a safe environment and be provided with scientific theories as alternatives. At this level effective learning environments provide opportunities for students to construct new understandings and validate scientific theories and explanations through:

- Providing frequent opportunities for students to engage in full and partial Inquiries
- Providing students with background content and theories to guide their design of observations and investigations.
- Helping students shape and modify their background knowledge through experiments and observations. Students should develop their abilities in systematic observation, making accurate measurements, and identifying and controlling variables.
- Since students in the middle years tend to center on evidence which supports their current beliefs, teachers need to challenge current beliefs and concepts that students hold and provide scientific theories as alternatives.
- Giving ample opportunity for students to establish and refine methods of experimentation, data collection and reporting.
- Encouraging students to develop skills to present their understandings using the language of science to communicate scientific explanations and ideas. Students should receive constructive criticism and questions and should be able to provide the same for fellow student groups and individuals.
- The use of writing, labeling drawings, completing concept maps, developing spreadsheets, and designing computer images and representations should be part of the middle school science experience.
- Use literature and technology, and graphic organizers to support different explanations and predictions

Science is a way of knowing and understanding the world around us. Because science plays a key role in developing an informed citizen, it is important that all middle school children have experience in the enterprise and content of science.

Franklin Middle School Science Curriculum

The exact material or themes covered within these categories will be determined through a series of SIG Curriculum meetings with the four 5th grade teachers, two 6th grade teachers, two 7th grade teachers, and one eighth grade science teacher, as they are the teachers fundamentally involved with the content.

We will be continuing to work on the cross-curricular distribution of teaching the topics and are continuing to focus on the student achievement and research-based approach to cross-content teaching techniques.

Grade 5

Physical Science
Space

Grade 6

Life Science
Earth Science

Grade 7

Physical Science
Botany

Grade 8

Life Science
Earth Science

We are diligent in our efforts to make the transition from each grade sensible, and within the district's buildings sensible.

5 – 6

Process Skills

Scientific Inquiry and Critical thinking Skills

MAKING OBSERVATIONS AND ASKING QUESTIONS		
S:SPS1:6:1.1 Make observations and record measurements using a variety of tools and instruments.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.2 Plan observations based on a given purpose.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.3 Identify and investigate similarities and differences among observations and sets of observations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.4 Use appropriate units and precision of metric measurement when recording data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.5 Use a classification key, such as a dichotomous key, to identify and distinguish among members of a group or set.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.6 Construct a simple classification key.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.7 Compare methods of classification for a specific purpose.		

S:SPS1:6:1.8 Ask questions about relationships between and among observations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.9 Determine which observations will be helpful to a given investigation.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:1.10 Distinguish between those questions that can be answered by science and those that cannot.		
Student Friendly/"I Can..." Statement	Resources	Assessments
DESIGNING SCIENTIFIC INVESTIGATIONS		
S:SPS1:6:2.1 Design and record a simple step-by-step procedure to follow in order to carry out a fair test of a scientific question.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:2.2 Identify and utilize appropriate tools/technology for collecting data in designing investigations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:2.3 Incorporate components of good experimental design, such as controls and multiple trials, into investigations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CONDUCTING SCIENTIFIC INVESTIGATIONS		
S:SPS1:6:3.1 Carry out simple student or teacher-developed procedures or experiments.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS1:6:3.2 Use appropriate tools to collect and record data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:3.3 Follow the teacher's instructions in performing experiments, following all appropriate safety rules and procedures.		
Student Friendly/"I Can..." Statement	Resources	Assessments
REPRESENTING AND UNDERSTANDING RESULTS OF INVESTIGATIONS		
S:SPS1:6:4.1 Use appropriate tools to organize, represent, analyze and explain data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:4.2 Make and record observations using a pre-determined format.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:4.3 Compare and display data in a variety of student or computer generated formats (such as diagrams, flow charts, tables, bar graphs, line graphs, scatter plots, and histograms).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:4.4 Identify patterns and relationships in data and formulate basic explanations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:4.5 Draw appropriate conclusions based on data collected.		
Student Friendly/"I Can..." Statement	Resources	Assessments

EVALUATING SCIENTIFIC EXPLANATIONS		
S:SPS1:6:5.1 Determine if the results of an experiment support or fail to support the scientific idea tested.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:6:5.2 Explain how a hypothesis is a direct extension of a scientific idea and therefore makes that idea "testable."		
Student Friendly/"I Can..." Statement	Resources	Assessments

Unifying Concepts of Science

NATURE OF SCIENCE (NOS)		
S:SPS2:6:1.1 Explain that scientists do not pay much attention to claims about how something works unless they are backed up with evidence that can be confirmed with a logical argument.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:1.2 Describe how results of similar and repeated investigations may vary and suggest possible explanations for variations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:1.3 Explain that sometimes similar investigations get different results because of unexpected differences in the things being investigated, the methods used, or the circumstances in which the investigation is carried out, and sometimes just because of uncertainties of observations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:1.4 Realize that if more than one variable changes at the same time in an experiment, the outcome of the experiment may not be clearly attributable to any one of the variables.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SYSTEMS AND ENERGY (SAE)		
S:SPS2:6:2.1 Recognize that thinking about things as systems means looking for how every part relates to others.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:2.2 Discover that collections of pieces (e.g., powders, marbles, sugar cubes or wooden blocks) may have properties that the individual pieces do not		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS2:6:2.3 Estimate or predict the effect that making a change in one part of the system will have on other parts, and on the system as a whole.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:2.4 Compare a variety of forms of energy, including heat, light, sound, mechanical, electrical, and chemical energy.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:2.5 Demonstrate how energy can be transformed from one form to another (e.g., from electrical energy to heat, light or mechanical energy).		
Student Friendly/"I Can..." Statement	Resources	Assessments
MODELS AND SCALE (MAS)		
S:SPS2:6:3.1 Understand that models are often used to think about processes that happen too slowly, too quickly, or on too small a scale to observe directly; or that are too vast to be changed deliberately; or that are potentially dangerous.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:3.2 Analyze how finding out the biggest and smallest values of something are often as revealing as knowing what the usual value is.		
Student Friendly/"I Can..." Statement	Resources	Assessments
PATTERNS OF CHANGE (POC)		
S:SPS2:6:4.1 Understand that things change in steady, repetitive, or irregular ways, or sometimes in more than one way at the same time; often the best way to tell which kinds of change are happening is to make a table or graph of measurements.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS2:6:4.2 Discover how a system may stay the same because nothing is happening or because things are happening that exactly balance each other out.		
Student Friendly/"I Can..." Statement	Resources	Assessments
FORM AND FUNCTION (FAF)		
S:SPS2:6:5.1 Describe the structure and function of organs.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:5.2 Diagram and label the structure of the primary components of representative organs in plants and animals.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:6:5.3 Investigate the relationship between various landforms and wind currents.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Personal, Social, and Technological Perspectives

COLLABORATION IN SCIENTIFIC ENDEAVORS		
S:SPS3:6:1.1 Work effectively within a cooperative group setting, accepting and executing assigned roles and responsibilities.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:6:1.2 Work collectively within a group toward a common goal.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:6:1.3 Demonstrate respect of one another's abilities and contributions to the group.		
Student Friendly/"I Can..." Statement	Resources	Assessments
COMMON ENVIRONMENTAL ISSUES, NATURAL RESOURCES MANAGEMENT AND CONSERVATION		
S:SPS3:6:2.1 Develop, focus and explain questions about the environment and do environmental investigations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:6:2.2 Design environmental investigations to answer particular questions.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:6:2.3 Explore evidence that human-caused changes have consequences for the immediate environment as well as for other places and future times.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:6:2.4 Explore how humans shape and control the environment while creating knowledge and developing new technologies.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS3:6:2.5 Investigate environmental and resource management issues at scales that range from local to national to global.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SCIENCE AND TECHNOLOGY, TECHNOLOGICAL DESIGN AND APPLICATION		
S:SPS3:6:3.1 Identify problems/issues that can be addressed by design technology.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:6:3.2 Identify and describe the procedure for designing a product, including identifying a need, researching, brainstorming, selecting, developing a prototype, testing and evaluating.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:6:3.3 Evaluate technological designs using established criteria.		
Student Friendly/"I Can..." Statement	Resources	Assessments

ESS1– The Earth and Earth materials, as we know them today, have developed over long periods of time, through constant change processes.

ATMOSPHERE, CLIMATE, AND WEATHER		
S:ESS1:6:1.1 Describe and make predictions about local and regional weather conditions using observation and data collection methods.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Identify weather conditions. • Track/record weather over a period of time. • Identify weather trends and patterns. • Summarize weather patterns in given season. 	Resources	Assessments
S:ESS1:6:1.2 Identify weather patterns by tracking weather related events, such as hurricanes.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Observe weather conditions. • Analyze weather condition. • Compare weather conditions • Describe weather conditions at a given time. 	Resources	Assessments
S:ESS1:6:1.3 Explain the composition and structure of the Earth's atmosphere.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Identify rocks. • Identify soil. • Identify water. • Recognize where rocks can be found • Recognize where soil can be found. • Recognize where water can be found. 	Resources	Assessments
S:ESS1:6:1.4 Describe weather in terms of temperature, wind speed and direction, precipitation, and cloud cover.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain temperature, wind speed and direction, precipitation, and cloud cover. • Make weather observations. 	Resources	Assessments

S:ESS1:6:1.5 Describe how clouds affect weather and climate, including precipitation, reflecting light from the sun, and retaining heat energy emitted from the Earth's surface.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Summarize how clouds affect weather. Summarize how clouds affect climate. 	Resources	Assessments
COMPOSITION AND FEATURES		
S:ESS1:6:2.1 Differentiate between renewable and non-renewable resources.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Identify a renewable resource. Identify a non-renewable resource. Distinguish between a renewable and non-renewable resource. 	Resources	Assessments
S:ESS1:6:2.2 Describe and define the different landforms on the Earth's surface, such as coastlines, rivers, mountains, deltas, canyons, etc.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define a coastline. Define a river. Define a mountain. Define a delta. Define a canyon. Distinguish differences between landforms. Describe different landforms. 	Resources	Assessments
S:ESS1:6:2.3 Identify and distinguish between various landforms using a map and/or digital images.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Locate various landforms on a map. Construct a map showing various landforms. Summarize the differences between various landforms on a map/digital image. 	Resources	Assessments
FOSSILS		
S:ESS1:6:3.1 Recognize that fossils offer important evidence relating to changes in life forms and environmental conditions over geologic time.		

<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define fossils. • Explain how fossils indicate changes to the environment. • Summarize geologic time. 	<p>Resources</p>	<p>Assessments</p>
<p>S:ESS1:6:3.2 Identify connections between fossil evidence and geological events, such as changes in atmospheric composition, movement of tectonic plates, and asteroid/comet impact; and develop a means of sequencing this evidence.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Makes inferences from fossil evidence. • Investigate and display geological events. 	<p>Resources</p>	<p>Assessments</p>
<p>OBSERVATION OF THE EARTH FROM SPACE</p>		
<p>S:ESS1:6:4.1 Recognize that images taken of the Earth from space can show its features and any changes in those features that appear over time.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Using images from space, identify Earth's features. • Comparing and contrasting a series of images taken over time, recognize changes in features. 	<p>Resources</p>	<p>Assessments</p>
<p>S:ESS1:6:4.2 Explain that satellites can be used to view and track storms and Earth events, such as hurricanes and wild fires.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Summarize how satellites are used. 	<p>Resources</p>	<p>Assessments</p>
<p>PROCESSES AND RATES OF CHANGE</p>		
<p>S:ESS1:6:5.1 Recognize that things change in steady, repetitive, or irregular ways, or sometimes in more than one way at the same time.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Explain how things change. • Investigate and give examples of 	<p>Resources</p>	<p>Assessments</p>

change.		
S:ESS1:6:5.2 Explain how some changes to the Earth’s surface happen abruptly, as a result of landslides, earthquakes and volcanic eruptions; while other changes happen very slowly as a result of weathering, erosions and deposition of sediment caused by waves, wind, water and ice.		
Student Friendly/”I Can...” Statement <ul style="list-style-type: none"> • Define weathering. • Define erosion. • Define deposition. • Define sediment. • Give examples of conditions or events that suddenly change Earth’s surface. • Describe changes to Earth surface that occur over time. 	Resources	Assessments
S:ESS1:6:5.3 Recognize that vibrations in materials set up wavelike disturbances that spread away from the source, as with earthquakes.		
Student Friendly/”I Can...” Statement <ul style="list-style-type: none"> • Define earthquake. • Explain the movement of vibrations. 	Resources	Assessments
ROCK CYCLE		
S:ESS1:6:6.1 Explain how soil is formed from combinations of weathered rock and decomposed plant and animal remains, and that it contains living organisms.		
Student Friendly/”I Can...” Statement <ul style="list-style-type: none"> • Summarize how soil is formed. 	Resources	Assessments
S:ESS1:6:6.2 Identify the components of soil and other factors, such as bacteria, fungi and worms, which influence its texture, fertility, and resistance to erosion.		
Student Friendly/”I Can...” Statement <ul style="list-style-type: none"> • Define bacteria. • Define fungi. • Define texture. • Define resistance. • Describe what makes up soil. • Summarize the factors that affect soil 	Resources	Assessments

conditions.		
S:ESS1:6.6.3 Describe the properties of soil, such as color, texture, capacity to retain water, and its ability to support plant life.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define retain. • List the properties of soil. • Explain the properties of soil. 	Resources	Assessments
WATER		
S:ESS1:6:7.1 Explain the properties that make water an essential component of the Earth's system, including solvency and its ability to maintain a liquid state at most temperatures.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define solvency. • Define properties. • Define essential. • Summarize the important properties of water. 	Resources	Assessments
S:ESS1:6:7.2 Explain that water quality has a direct effect on Earth's life forms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define quality. • Summarize water quality. • Investigate the effect of water quality on life. 	Resources	Assessments

ESS2– The Earth is part of a solar system, made up of distinct parts, which have temporal and spatial interrelationships.

EARTH, SUN, AND MOON		
S:ESS2:6:1.1 Recognize and describe how the regular and predictable motions of the Earth and Moon explain certain Earth phenomena, such as day and night, the seasons, the year, shadows and the tides.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define predictable. • Define phenomena. • Summarize how Earth's movement impact natural events. • Summarize how the Moon's movement affects natural events. 	Resources	Assessments
S:ESS2:6:1.2 Recognize that of all the known planets, Earth appears to be somewhat unique; and describe the conditions that exist on Earth that allow it to support life.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define unique. • Explain conditions that support life. • Compare and contrast the planets and their ability to support life. 	Resources	Assessments
ENERGY		
S:ESS2:6:2.1 Recognize how the tilt of the Earth's axis and the Earth's revolution around the Sun affect seasons and weather patterns.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define axis. • Define revolution. • Explain how the tilt of Earth's axis affects seasons and weather patterns. • Summarize how Earth's revolution affects seasons and weather patterns. 	Resources	Assessments
S:ESS2:6:2.2 Identify and describe seasonal, daylight and weather patterns as they relate to energy.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define energy. • Explain energy from seasons. • Explain energy from daylight. 	Resources	Assessments

<ul style="list-style-type: none"> • Explain energy from weather patterns. 		
VIEW FROM EARTH		
S:ESS2:6:4.1 Explain the historical perspective of planetary exploration and man’s achievements in space, beginning with Russia’s Sputnik mission in 1957.		
<p>Student Friendly/“I Can...” Statement</p> <ul style="list-style-type: none"> • Define historical. • Define planetary. • Define achievement. • Investigate planetary exploration. • Construct a display of achievements in space. 	Resources	Assessments
S:ESS2:6:4.2 Describe man’s perception of the constellations throughout history; and explain how he has used them to his advantage, including navigational purposes and to explain historical events.		
<p>Student Friendly/“I Can...” Statement</p> <ul style="list-style-type: none"> • Define constellations. • Define navigational. • Define perception. • Show how man’s understanding on constellations has changed. • Explain how constellations helped man. • Collect and display various ways man has used constellations. 	Resources	Assessments

ESS4–The growth of scientific knowledge in Earth Space Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:ESS4:6:1.1 Understand that technology is used to design tools that improve our ability to measure and observe the world.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define technology. • Explain how technology aides in tool design. • Give examples of tools that help man measure the world. • Give examples of tools that help man observe the world. 	Resources	Assessments
S:ESS4:6:2.1 Recognize that satellites and Doppler radar can be used to observe or predict the weather.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define satellites. • Define Doppler radar. • Investigate weather satellites. • Summarize the use of Doppler radar. • Compare and contrast satellites and Doppler radar. 	Resources	Assessments
S:ESS4:6:2.2 Employ knowledge of basic weather symbols to read and interpret weather and topographic maps.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Identify basic weather symbols. • Read weather and/or topographic maps. • Draw conclusions from weather and/or topographic maps. 	Resources	Assessments
S:ESS4:6:2.3 Read and interpret data from barometers, sling psychrometers and anemometers.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain the use of a barometer. • Explain the use of a sling 	Resources	Assessments

<p>psychrometer.</p> <ul style="list-style-type: none"> • Explain the use of an anemometer. • Read and draw conclusions from a barometer. • Read and draw conclusions from a sling psychrometer. • Read and draw conclusions from an anemometer. • Collect and display data from a barometer, sling psychrometer, and anemometer. 		
LOCAL AND GLOBAL ENVIRONMENTAL ISSUES		
S:ESS4:6:3.1 Provide examples of products that man has developed which allow humans to do things that they could not do otherwise; and identify the natural materials used to produce these products.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Investigate products that significantly helped man. • List products that man could not perform the function without. • Identify natural materials used. 	Resources	Assessments
S:ESS4:6:3.2 Identify the most appropriate materials for a given design task with requirements for specific properties, such as weight, strength, hardness, and flexibility.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Investigate the best materials for a given design. • Create a model addressing a design task. 	Resources	Assessments
S:ESS4:6:3.3 Provide examples of how to reduce waste through conservation, recycling, and reuse.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define conservation. • Define recycling. • Define reuse. • Investigate ways to reduce waste. 	Resources	Assessments

<ul style="list-style-type: none"> Develop a logical argument to support the reduction of waste. 		
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:ESS4:6:4.1 Understand that some form of science is used in most jobs/careers and that some jobs/careers specifically require knowledge of Earth science.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Explain that most jobs/careers include science. Identify jobs/careers that include science. Investigate jobs/careers that focus on Earth science. 	Resources	Assessments

Life Science

LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

CLASSIFICATION		
S:LS1:6:1.1 Identify ways in which living things can be grouped and organized, such as taxonomic groups of plants, animals and fungi.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define taxonomic groups • Summarize traits that plants have in common • Summarize traits that animals have in common • Summarize traits that fungi have in common • Group living things based on common traits 	Resources	Assessments
S:LS1:6:1.2 Categorize organisms into kingdoms that are currently recognized, according to shared characteristics.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define kingdoms • Summarize the characteristics of each kingdom • Categorize organisms into kingdoms based on their characteristics 	Resources	Assessments
LIVING THINGS AND ORGANIZATION		
S:LS1:6:2.1 Recognize that all living things are composed of cells, and explain that while many organisms are single celled, such as yeast, others, including humans, are multicellular.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define multicellular • Explain that all living things are made up of cells • Compare single-celled and multicellular organisms • Contrast single-celled and multicellular organisms 	Resources	Assessments

S:LS1:6:2.2 Explain that the way in which cells function is similar in all organisms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the functions of the cell • Contrast the functions of plant cells and animal cells • Compare the functions of plant cells and animal cells • Summarize the ways that cells function the same for all organisms 	Resources	Assessments
S:LS1:6:2.3 Recognize that cells use energy obtain from food, to conduct the functions necessary to sustain life, such as cell growth.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define sustain • Define cell growth • Describe functions of cells needed for life • Explain that organisms either eat food for energy or make their own food for energy 	Resources	Assessments
S:LS1:6:2.4 Recognize and describe the hierarchical organization of living systems, including cells, tissues, organs, organ systems, whole organisms, and ecosystems.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define hierarchy • Define tissues • Define organs • Define organ systems • Define organisms • Define ecosystems Explain the similarities and differences between whole organisms and ecosystems • Use a graphic organizer to show the organization of living systems • Create a model of an ecosystem showing the organization of living systems within it 	Resources	Assessments
S:LS1:6:2.5 Explain that multicellular organisms have specialized cells, tissues, organs and organ systems that perform certain necessary functions, including digestion, respiration, reproduction, circulation, excretion, movement, control and coordination and protection from disease.		

Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:6:2.6 Recognize that the human cells found in tissues and organs are similar to those of other animals, but somewhat different from cells found in plants.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain the similarities of human cells to other animals, • Compare and contrast human cells from plant cells. 	Resources	Assessments
REPRODUCTION		
S:LS1:6:3.1 Explain that cells repeatedly divide to make more cells for growth and repair.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Investigate cell growth. • Investigate how cells repair themselves. • Summarize cell growth. • Summarize cell repair. 	Resources	Assessments
S:LS1:6:3.2 Explain that the same genetic information is copied in each cell of a new organism.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define genetic. 	Resources	Assessments
S:LS1:6:2.6 Recognize that the human cells found in tissues and organs are similar to those of other animals, but somewhat different from cells found in plants.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Identify the similarities between human cells in tissues/organs and animals. • Identify the differences between human cells in tissues/organs and plant cells. 	Resources	Assessments
REPRODUCTION		

S:LS1:6:3.1 Explain that cells repeatedly divide to make more cells for growth and repair.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Investigate cell division. • Investigate how cells repair themselves. • Summarize how cells grow. • Summarize how cells repair themselves. 	Resources	Assessments
S:LS1:6:3.2 Explain that the same genetic information is copied in each cell of a new organism.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Summarize how genetic information is copied. 	Resources	Assessments
S:LS1:6:3.3 Explain that all living things reproduce in order to continue their species.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define species. • Investigate how living things maintain their species. • Summarize how living things continue their species. 	Resources	Assessments

LS2– Energy flows and matter recycles through an ecosystem.

ENVIRONMENT		
S:LS2:6:1.1 Identify and describe the factors that influence the number and kinds of organisms an ecosystem can support, including the resources that are available, the differences in temperature, the composition of the soil, any disease, the threat of predators, and competition from other organisms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define organism. • Define ecosystem. • Investigate the various factors that affect organisms in an ecosystem. • Explain the factors that affect a specific organism's survival in its ecosystem. 	Resources	Assessments
S:LS2:6:1.2 Explain that most microorganisms do not cause disease and that many are beneficial to the environment.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define microorganisms. • Define environment. • Investigate the benefits of microorganisms. • Explain how microorganisms help the environment. 	Resources	Assessments
FLOW OF ENERGY		
S:LS2:6:2.1 Describe how energy is transferred in an ecosystem through food webs; and explain the roles and relationships between producers, consumers and decomposers.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define food webs. • Define producer. • Define consumer. • Define decomposer. • Investigate the transfer of energy in an ecosystem. • Explain how food webs illustrate the 	Resources	Assessments

<ul style="list-style-type: none"> transfer of energy. Explain the relationship between producers, consumers, and decomposers. Collect and display information of a food web from a specific ecosystem. 		
S:LS2:6:2.2 Recognize that one of the most general distinctions among organisms is between plants, which use sunlight to make their own food, and animals, which consume energy-rich foods.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Compare and contrast how plants and animals receive energy. 	Resources	Assessments
S:LS2:6:2.3 Describe the process of photosynthesis and explain that plants can use the food they make immediately or store it for later use.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define photosynthesis. Investigate the process of photosynthesis. Collect and display the process of photosynthesis. Explain how plants use the food from photosynthesis. 	Resources	Assessments
S:LS2:6:2.4 Recognize that energy, in the form of heat, is usually a byproduct when one form of energy is converted to another, such as when living organisms transform stored energy to motion.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define byproduct Define transform Summarize how heat is given off or absorbed when energy changes to different forms Explain how an organism might use its stored energy 	Resources	Assessments
RECYCLING OF MATERIALS		
S:LS2:6:3.1 Define a population as all individuals of a species that exist together at a given place and time; and explain that all populations living together in a community, along with the physical factors with which they interact, compose an ecosystem.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ul style="list-style-type: none"> • Define population. • Describe the relationship between population and community. • Explain how a community and its physical factors create an ecosystem. 		
<p>S:LS2:6:3.2 Using food webs, identify and describe the ways in which organisms interact and depend on one another in an ecosystem.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Identify interactions in a food web. • Summarize the interactions in a food web of a specific ecosystem. 	<p>Resources</p>	<p>Assessments</p>
<p>S:LS2:6:3.3 Explain how insects and various other organisms depend on dead plant and animal matter for food; and describe how this process contributes to the system.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Investigate organisms that use dead plant/animal matter. • Explain how organisms use dead plant/animal matter for food. • Summarize how using dead organisms for food helps an ecosystem. 	<p>Resources</p>	<p>Assessments</p>

LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry).

CHANGE		
S:LS3:6:1.1 Provide examples of how all organisms, including humans, impact their environment; and explain how some changes can be detrimental to other organisms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate how organisms impact an environment. Summarize the cause and effect of an organism's impact to its environment. Summarize how an organism's impact can harm organisms. 	Resources	Assessments
S:LS3:6:1.2 Explain how changes in environmental conditions can affect the survival of individual organisms and the entire species.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate environmental changes. Explain how changes to the environment affect an organism's survival. Explain the cause/effect of an environmental condition on a specific species. 	Resources	Assessments
EVIDENCE OF EVOLUTION		
S:LS3:6:2.1 Describe the fundamental concepts related to biological evolution, such as biological adaptations and the diversity of species.		
Student Friendly/"I Can..." Statement <p>Define biological evolution. Define biological adaptation. Define diversity. Investigate and explain biological evolution.</p>	Resources	Assessments
NATURAL SELECTION		
S:LS3:6:3.1 Recognize that there are genetic variations among individuals in groups of organisms and provide examples of how these variations affect the survival of an organism.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ul style="list-style-type: none"> • Define genetic variation. • Investigate genetic variation in a specific organism. • Give examples how genetic variation affects an organisms survival. 		
<p>S:LS3:6:3.2 Recognize that only organisms that are able to reproduce can pass on their genetic information to the next generation.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Investigate the transfer of genetic information. • Explain how genetic information is passed on. 	<p>Resources</p>	<p>Assessments</p>

LS4– Humans are similar to other species in many ways, and yet are unique among Earth’s life forms.

BEHAVIOR		
S:LS4:6:1.1 Recognize that learning requires more than just storage and retrieval of information and that prior knowledge needs to be tapped in order to make sense out of new experiences or information.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate humans learn. List the major factors necessary for human learning. Summarize the process of human learning. 	Resources	Assessments
S:LS4:6:1.2 Explain that people can learn about others from direct experience, from the media, and from listening to others talk about their life and work.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate how people learn about others. List the majors factors used to learn about others. Summarize how people learn about others. 	Resources	Assessments
S:LS4:6:1.3 Provide examples of how humans make judgments about new situations based on memories of past experiences.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate how humans use memories to make decisions. Collect and give examples of how humans infer from past experiences. 	Resources	Assessments
DISEASE		
S:LS4:6:2.1 Explain that the human body has ways to defend itself against disease-causing organisms and describe how defenders, including tears, saliva, the skin, some blood cells and stomach secretions support the defense process.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate how the human body protects itself from disease. List factors that protect the human body from disease. 	Resources	Assessments

<ul style="list-style-type: none"> Summarize how the human body defend itself against disease. 		
S:LS4:6:2.2 Recognize that there are some diseases that human beings can only get once; and explain how many diseases can be prevented by vaccination.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define vaccination. Investigate human diseases. List the human diseases that humans get once. Investigation the purpose for vaccinations. List the diseases that can be prevented by vaccinations. 	Resources	Assessments
S:LS4:6:2.3 Explain how vaccines induce the body to build immunity to a disease without actually causing the disease itself.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define immunity. Define vaccines. Investigate and summarize how vaccines building immunity. Explain how immunity does not create the disease itself. 	Resources	Assessments
S:LS4:6:2.4 Recognize a healthy body cannot fight all germs that invade it; and explain how some germs interfere with the body's defenses.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> List factors of a healthy body. Compare and contrast a healthy body from an unhealthy body. Identify how the human body fights germs. Explain how germs affect the body's defenses. 	Resources	Assessments
HUMAN IDENTITY		
S:LS4:6:3.1 Recognize that the length and quality of human life are influenced by many factors, including sanitation, diet, medical care, gender,		

genes, environmental conditions, and personal health behaviors.

Student Friendly/"I Can..." Statement	Resources	Assessments
<ul style="list-style-type: none">• Define sanitation.• Define gender.• Investigate factors that affect a human's quality of life.• Collect and display factors that affect the factors that affect the quality of life.		

LS5– The growth of scientific knowledge in Life Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:LS5:6:1.1 Recognize that an agricultural system is designed to maximize the use of all the elements in the system, including using plants for food, oxygen, for the filtration of air and water, and for making compost.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define agricultural system. • Investigate elements of an agricultural system. • Explain how the elements of the system are used. 	Resources	Assessments
TOOLS		
S:LS5:6:2.1 Demonstrate the appropriate use of tools, such as thermometers, probes, microscopes and computers to gather, analyze and interpret data in the life sciences.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define analyze. • Make observation using the correct scientific tool. • Interpret data from a scientific tool. 	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
MEDICAL TECHNOLOGY		
BIOTECHNOLOGY		
S:LS5:6:3.1 Provide examples of early health care technology that helped to extend the life expectancy of humans, such as the discovery of penicillin and sterilization of surgical instruments.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:LS5:6:3.2 Differentiate between vaccines, which help prevent diseases from developing and spreading, and medicines, which relieve symptoms or cure diseases.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:6:3.3 Recognize that the quality of personal health can be influenced by society and technology.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:6:3.4 Identify and describe some of the processes and systems used to grow food in New Hampshire, including irrigation, pest control and harvesting.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:LS5:6:4.1 Understand that some form of science is used in most jobs/careers and that some jobs/careers specifically require knowledge of life science.		
Student Friendly/"I Can..." Statement	Resources	Assessments
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PS1– All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size/amount of substance).

COMPOSITION		
S:PS1:6:1.1 Recognize that all matter is composed of minute particles called atoms; and explain that all substances are composed of atoms, each arranged into different groupings.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define atoms • Explain that all matter is made up of atoms • Define a substance • Use chemical formulas for substances to explain that different substances are made up of atoms arranged in different groups 	Resources	Assessments
S:PS1:6:1.2 Identify elements as substances that contain only one kind of atom; and explain that elements do not break down by normal laboratory reactions, such as heating, exposure to electric current, and reaction to acid.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define element • Define compound • Observe through laboratory reactions that some substances break down after exposure to heat, current, and acids • Observe through laboratory reactions that elements do not break down after exposure to heat, current, and acids 	Resources	Assessments
S:PS1:6:1.3 Recognize that over one hundred elements exist, and identify the periodic table as a tool for organizing the information about them.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Identify elements with common characteristics from the periodic table of elements • Recognize elements common to everyday life 	Resources	Assessments
PROPERTIES		

S:PS1:6:2.1 Identify elements according to their common properties, such as highly reactive metals, less reactive metals, highly reactive non-metals and almost non-reactive gases.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Distinguish between highly reactive metals and less reactive metals • Distinguish between highly reactive nonmetals and almost non-reactive gases • Describe the metallic elements • Identify several elements that are metallic • Describe the nonmetallic elements • Identify several elements that are nonmetallic 	Resources	Assessments
S:PS1:6:2.2 Identify substances by their physical and chemical properties, such as magnetism, conductivity, density, solubility, boiling and melting points.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define density, boiling point and melting point • Define magnetism, conductivity, and solubility • Describe the various properties of substances • Identify an unknown substance by comparing its properties to a standard list of properties, such as density, conductivity, etc. 	Resources	Assessments
S:PS1:6:2.3 Differentiate between weight and mass.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define weight • Define mass • Explain the difference between weight and mass • Provide examples of ways that weight can change but mass does not 	Resources	Assessments
S:PS1:6:2.4 Identify energy as a property of many substances.		

Student Friendly/"I Can..." Statement	Resources	Assessments
<ul style="list-style-type: none">• Describe the properties of substances• Define and describe energy• List several forms of energy• Given a list of common substances, identify the type of energy the substance may contain		

PS2– Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.

CHANGE		
S:PS2:6:1.1 Differentiate between a physical change, such as melting, and a chemical change, such as rusting.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define a physical change • Define a chemical change • Give examples of physical changes • Give examples of chemical changes • Explain the difference between a physical change and a chemical change • From an example, identify a change as physical or chemical 	Resources	Assessments
CONSERVATION		
S:PS2:6:2.1 Describe how mass remains constant in a closed system and provide examples relating to both physical and chemical change.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe a closed system • Define physical and chemical changes • Describe what happens to the mass when a substance goes through a physical change • Describe what happens to the mass when a substance goes through a chemical change • Observe a closed system, and find evidence to show that mass stays constant • Defend how I know whether or not mass is constant 	Resources	Assessments
ENERGY		
S:PS2:6:3.1 Explain that the pitch of a sound is dependent on the frequency of the vibration producing it.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain frequency of waves 	Resources <ul style="list-style-type: none"> • Ropes or slinkies to demonstrate 	Assessments

<ul style="list-style-type: none"> • Demonstrate using a physical means how vibrations have different frequencies • Define pitch of a sound • Observe the changes in pitch when vibrations of different frequencies are used • Explain what happens to pitch when the frequency changes 	<p>frequency of waves</p>	
<p>S:PS2:6:3.2 Explain that sound vibrations move at different speeds, have different wavelengths; and establish wave-like disturbances that emanate from the source.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define wavelength • Explain that sound waves move at different speeds • Explain that sound waves have different wavelengths • Observe wavelike disturbances that are produced by a sound source 	<p>Resources</p> <ul style="list-style-type: none"> • Tub of water and speaker with loud music to observe wavelike disturbances 	<p>Assessments</p>
<p>S:PS2:6:3.3 Recognize that energy, in the form of heat, is usually a by-product when one form of energy is changed to another, such as when machines convert stored energy to motion.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define kinetic energy and potential energy • Define heat • Describe how energy can change forms • Discuss the different forms energy can take on and determine whether they are kinetic or potential • Describe ways that heat energy is released or absorbed when energy changes forms. 	<p>Resources</p>	<p>Assessments</p>
<p>S:PS2:6:3.4 Explain that heat energy moves from warmer materials or regions to cooler ones through conduction, convection, and radiation.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Explain the process of heat energy 	<p>Resources</p>	<p>Assessments</p>

<p>transfer</p> <ul style="list-style-type: none"> • Define conduction, convection, and radiation • Explain how heat energy is transferred in the processes of conduction, convection, and radiation • Give examples of how heat energy flows from warmer to cooler regions 		
<p>S:PS2:6:3.5 Explain how electrical circuits can be used to transfer energy in order to produce heat, light, sound, and chemical changes.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Describe how to connect the parts of an electrical circuit including: a power source, at least 3 types of loads • Explain how the energy transfer takes place within the electrical circuit that I designed. 	<p>Resources</p>	<p>Assessments</p>

PS3– The motion of an object is affected by force.

FORCES		
S:PS3:6:1.1 Recognize that just as electric currents can produce magnetic forces, magnets can cause electric currents.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe the magnetic field produced by an electric current Explain how magnets can be used to produce electric currents 	Resources	Assessments
S:PS3:6:1.2 Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Explain the three ways that an object will react when a force is applied to it 	Resources	Assessments
S:PS3:6:1.3 Describe the relationship between the strength of a force on an object and the resulting effect, such as the greater the force, the greater the change in motion.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe how motion changes when a smaller force is applied to an object Describe how motion changes when a larger force is applied to an object 	Resources	Assessments
MOTION		
S:PS3:6:2.1 Explain the how balanced and unbalanced forces are related to an object's motion.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define a balanced force Define an unbalanced force Explain how balanced and unbalanced forces affect an object's motion 	Resources	Assessments
S:PS3:6:2.2 Explain that an object's motion can be tracked and measured over time and that the data can be used to describe its position.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Measure the distance an object travels over a period of time Measure the velocity of an object over a period of time 	Resources	Assessments

- | | | |
|---|--|--|
| <ul style="list-style-type: none">• Graph the data I have collected for the object• Use my graphed data to describe the position of an object at any point in time | | |
|---|--|--|

PS4– The growth of scientific knowledge in Physical Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:PS4:6:1.1 Understand that scientific principles are used in the design of technology.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Give examples of ways that scientific principles have been used in the design of technology 	Resources	Assessments
TOOLS		
S:PS4:6:2.1 Recognize that manufacturing processes use a variety of tools and machines to separate, form, combine and condition natural and synthetic materials.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe a manufacturing process Give examples of natural and synthetic materials used as raw materials in the manufacturing process Describe the variety of tools and machines used in the manufacturing process Write a procedure for a manufacturing process which includes separating, forming, combining, and conditioning materials. 	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
ENERGY, POWER, AND TRANSPORTATION		
MANUFACTURING		
S:PS4:6:3.1 Explain how a battery changes chemical energy into electrical energy.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> State the Law of Conservation of Energy Create a circuit that lights up a light 	Resources	Assessments

bulb <ul style="list-style-type: none"> • Describe the parts of a battery • Explain which parts of the battery contain chemical energy • Describe the process of changing a battery's chemical energy to electrical energy 		
S:PS4:6:3.2 Demonstrate how to produce a magnetic force with an electric current, such as an electromagnet, and how to produce an electric current with a magnet, such as a generator.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe a magnetic force • Explain how an electric current produces a magnetic force • Define a generator • Describe the procedure for producing a magnetic force from an electric current • Describe the procedure for producing an electric current with a magnet 	Resources	Assessments
S:PS4:6:3.3 Provide an example to show that manufacturing processes involve changing natural materials into finished products through a series of processes that involve physical and/or chemical changes.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Give examples of physical changes that take place in a manufacturing process • Give examples of chemical changes that take place in a manufacturing process • Write a procedure that shows the sequence of steps in the manufacturing process, identifying where physical and chemical changes take place 	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:PS4:6:4.1 Understand that some form of science is used in most jobs/careers and that some jobs/careers specifically require knowledge of physical science.		

Student Friendly/"I Can..." Statement	Resources	Assessments
<ul style="list-style-type: none"><li data-bbox="237 277 716 363">• Identify several jobs/careers where a knowledge of physical science is needed<li data-bbox="237 370 680 422">• Given a job/career, explain where science is used in that job		

7 – 8

Process Skills

Scientific Inquiry and Critical thinking Skills

MAKING OBSERVATIONS AND ASKING QUESTIONS		
S:SPS1:8:1.1 Use appropriate tools to accurately collect and record both qualitative and quantitative data gathered through observations (e.g., temperature probes, electronic balances, spring scales, microscopes, stop watches).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:1.2 Determine the degree of accuracy that can be obtained using a given instrument.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:1.3 Investigate similarities and differences noted when making observations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:1.4 Construct and use a dichotomous key to classify a given set of objects or organisms.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:1.5 Evaluate methods of classification for a specific purpose.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:1.6 Rephrase questions so that they can be tested or investigated using scientific methodologies.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS1:8:1.7 Ask questions about relationships between and among observable variables.		
Student Friendly/"I Can..." Statement	Resources	Assessments
DESIGNING SCIENTIFIC INVESTIGATIONS		
S:SPS1:8:2.1 Identify the manipulated, responding and controlled variables in an experiment.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:2.2 Design a controlled experiment, identifying and controlling the major variables.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:2.3 Identify flaws or omissions in the design of simple experiments.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CONDUCTING SCIENTIFIC INVESTIGATIONS		
S:SPS1:8:3.1 Use appropriate laboratory techniques to carry out student- or teacher-developed procedures or experiments.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:3.2 Use appropriate tools to gather data as part of an investigation (e.g., ruler, meter stick, thermometer, spring scale, graduated cylinder, calipers, balance, probes, microscopes).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:3.3 Follow the teacher's instructions in performing experiments, following all appropriate safety rules and procedures.		
Student Friendly/"I Can..." Statement	Resources	Assessments

REPRESENTING AND UNDERSTANDING RESULTS OF INVESTIGATIONS		
S:SPS1:8:4.1 Use appropriate tools (including computer hardware and software) to collect, organize, represent, analyze and explain data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:4.2 Identify sources of error in experiments.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:4.3 Draw appropriate conclusions regarding the scientific question under investigation, based on the data collected.		
Student Friendly/"I Can..." Statement	Resources	Assessments
EVALUATING SCIENTIFIC EXPLANATIONS		
S:SPS1:8:5.1 Determine if the results of an experiment support or refute the scientific idea tested.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:5.2 Evaluate whether the information and data collected allows an evaluation of the scientific idea under investigation.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS1:8:5.3 Determine what additional information would be helpful in answering the scientific question.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Unifying Concepts of Science

NATURE OF SCIENCE (NOS)		
S:SPS2:8:1.1 Describe how scientific investigations usually involve the collection of relevant evidence, the use of logical reasoning, and the application of imagination in devising hypotheses and explanations to make sense of the collected evidence.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:1.2 Realize that when similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, and this often requires more investigations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:1.3 Realize that knowledge, based on science, is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:1.4 Provide examples that show how some scientific knowledge is very old and yet is still applicable today.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:1.5 Recognize that some matters cannot be examined usefully in a scientific way, such as those matters that by their nature cannot be tested objectively and those that are essentially matters of morality.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:1.6 Give examples of how science can sometimes be used to inform ethical decisions by identifying the likely consequences of particular actions but cannot be used to establish that some action is either moral or immoral.		
Student Friendly/"I Can..." Statement	Resources	Assessments

SYSTEMS AND ENERGY (SAE)		
S:SPS2:8:2.1 Understand that any system is usually connected to other systems, both internally and externally; thus a system may be thought of as containing subsystems and as being a subsystem of a larger system.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:2.2 Analyze how the output of one part of a system, which can include materials, energy or information, can become the input to other parts.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:2.3 Realize that as the complexity of any system increases, gaining an understanding of it depends increasingly on summaries (such as averages and ranges) and on descriptions of typical examples of that system.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:2.4 Explain that when energy is transformed or converted from one type to another, there is no net loss of energy.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:2.5 Describe how objects and substances can store energy (e.g., a battery, food, gasoline).		
Student Friendly/"I Can..." Statement	Resources	Assessments
MODELS AND SCALE (MAS)		
S:SPS2:8:3.1 Demonstrate how mathematical models can be displayed on a computer and then modified to see what happens.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS2:8:3.2 Know that different models can be used to represent the same thing; what kind of model is used and how complex it should be depends on its purpose; and the usefulness of a model is one of the instances in which intuition and creativity come into play in science, mathematics and engineering.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:3.3 Discover how properties of systems that depend on volume, such as capacity and weight change, change out of proportion to properties that depend on area, such as strength or surface processes.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:3.4 Recognize that as the complexity of any system increases, gaining an understanding increasingly depends on summaries (such as averages and ranges) and on descriptions of typical examples of that system.		
Student Friendly/"I Can..." Statement	Resources	Assessments
PATTERNS OF CHANGE (POC)		
S:SPS2:8:4.1 Analyze how physical and biological systems tend to change until they become stable and then stay that way unless their surroundings change.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:4.2 Recognize how many systems contain feedback mechanisms that serve to keep changes within specified limits.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:4.3 Realize that symbolic equations can be used to summarize how the quantity of something changes over time or in response to other changes.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS2:8:4.4 Explain how symmetry (or the lack of it) may determine properties of many objects, from molecules and crystals to organisms and designed structures.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:4.5 Realize that cycles, such as the seasons or body temperature, can be described by their cycle length or frequency, what their highest and lowest values are, and when those values occur; different cycles range from many thousand years down to less than a billionth of a second.		
Student Friendly/"I Can..." Statement	Resources	Assessments
FORM AND FUNCTION (FAF)		
S:SPS2:8:5.1 Describe the relationship between structure and function of organ systems in plants and animals.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:5.2 Describe the structure and function of various organ systems (i.e., digestion, respiration, circulation, nervous, protection and support) and how these systems contribute to homeostasis of the organism.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS2:8:5.3 Compare the structure and function of organ systems in one organism to the structure and function in another organism.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Personal, Social, and Technological Perspectives

COLLABORATION IN SCIENTIFIC ENDEAVORS		
S:SPS3:8:1.1 Work effectively within a cooperative group setting, accepting and executing assigned roles and responsibilities.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:8:1.2 Work collectively within a group toward a common goal.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:8:1.3 Demonstrate respect of one another's abilities and contributions to the group.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:8:1.4 Demonstrate an understanding of the ethics involved in scientific inquiry.		
Student Friendly/"I Can..." Statement	Resources	Assessments
COMMON ENVIRONMENTAL ISSUES, NATURAL RESOURCES MANAGEMENT AND CONSERVATION		
S:SPS3:8:2.1 Locate and collect reliable information about the environment and environmental topics using a variety of methods and sources.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:8:2.2 Judge the weaknesses and strengths of the information they are using.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:8:2.3 Explore the uses and limitations of models.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS3:8:2.4 Synthesize observations and findings into coherent explanations about natural resources and the environment.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SCIENCE AND TECHNOLOGY, TECHNOLOGICAL DESIGN AND APPLICATION		
S:SPS3:8:3.1 Design a product or solution to a problem.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:8:3.2 Build a product that has been designed in class.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:8:3.3 Evaluate student-designed products according to established criteria and recommend improvements or modifications.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Science Skills for Information, Communication and Media Literacy

INFORMATION AND MEDIA LITERACY		
S:SPS4:8:1.1 Use a variety of information access tools to locate, gather, and organize potential sources of scientific information to answer questions.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:1.2 Collect real-time observations and data, synthesizing and building upon existing information (e.g., online databases, NOAA, EPA, USGS) to solve problems.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:1.3 Use appropriate tools to analyze and synthesize information (e.g., diagrams, flow charts, frequency tables, bar graphs, line graphs, stem-and-leaf plots) to draw conclusions and implications based on investigations of an issue or question.		
Student Friendly/"I Can..." Statement	Resources	Assessments
COMMUNICATION SKILLS		
S:SPS4:8:2.1 Use a wide range of tools and a variety of oral, written, and graphic formats to share information and results from observations and investigations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CRITICAL THINKING AND SYSTEMS THINKING		
S:SPS4:8:3.1 Execute steps of scientific inquiry to engage in the problem-solving and decision making processes.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:3.2 Apply new and unusual applications of existing knowledge to new and different situations.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS4:8:3.3 Make sketches, graphs, and diagrams to explain ideas and to demonstrate the interconnections between systems.		
Student Friendly/"I Can..." Statement	Resources	Assessments
PROBLEM IDENTIFICATION, FORMULATION, AND SOLUTION		
S:SPS4:8:4.1 Formulate a scientific question about phenomena, a problem, or an issue and using a broad range of tools and techniques; and plan and conduct an inquiry to address the question.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:4.2 Use evidence collected from observations or other sources and use them to create models and explanations.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CREATIVITY AND INTELLECTUAL CURIOSITY		
S:SPS4:8:5.1 Use a variety of media tools to make oral and written presentations, which include written notes and descriptions, drawings, photos, and charts to communicate the procedures and results of an investigation.		
Student Friendly/"I Can..." Statement	Resources	Assessments
INTERPERSONAL AND COLLABORATIVE SKILLS		
S:SPS4:8:6.1 Work in diverse pairs/teams to answer questions, solve problems and make decisions.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:6.2 Plan and develop team science projects.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:6.3 Articulate understanding of content through personal interaction and sharing with peers.		
Student Friendly/"I Can..." Statement	Resources	Assessments

SELF DIRECTION		
S:SPS4:8:7.1 Keep a journal of observations and investigations, and periodically evaluate entries to assess progress toward achieving the understanding of key ideas.		
Student Friendly/"I Can..." Statement	Resources	Assessments
ACCOUNTABILITY AND ADAPTABILITY		
S:SPS4:8:8.1 Develop and execute a plan to collect and record accurate and complete data from various sources to solve a problem or answer a question; and gather and critically analyze data from a variety of sources.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:8.2 Participate in science competitions, where students are responsible for creating a product or participating in an event.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOCIAL RESPONSIBILITY		
S:SPS4:8:9.1 Collaborate with a network of learners by phone, video, virtual classroom platform.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:8:9.2 Participate in simulation or role-playing activities in which students grapple with the ethics of complex issues.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Earth Space Science

ESS1– The Earth and Earth materials, as we know them today, have developed over long periods of time, through constant change processes.

ATMOSPHERE, CLIMATE, AND WEATHER		
S:ESS1:8:1.1 Identify and describe the processes of the water cycle and explain their effects on climatic patterns.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:1.2 Identify and describe the impact certain factors have on the Earth's climate, including changes in the oceans' temperature, changes in the composition of the atmosphere, and geological shifts due to events such as volcanic eruptions and glacial movements.		
Student Friendly/"I Can..." Statement	Resources	Assessments
COMPOSITION AND FEATURES		
S:ESS1:8:2.1 Describe the layers of the Earth, including the core, mantle, lithosphere, hydrosphere, and atmosphere.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:2.2 Use geological evidence provided to support the idea that Earth's crust/lithosphere is composed of plates that move.		
Student Friendly/"I Can..." Statement	Resources	Assessments
FOSSILS		
S:ESS1:8:3.1 Explain how fossils found in sedimentary rock can be used to support the theories of Earth's evolution over geologic time; and describe how the folding, breaking, and uplifting of the layers affects the evidence.		
Student Friendly/"I Can..." Statement	Resources	Assessments
OBSERVATION OF THE EARTH FROM SPACE		

S:ESS1:8:4.1 Describe how catastrophic changes that have taken place on the Earth's surface can be revealed by satellite images.		
Student Friendly/"I Can..." Statement	Resources	Assessments
PROCESSES AND RATES OF CHANGE		
S:ESS1:8:5.1 Explain that the Earth's crust is divided into plates which move at extremely slow rates in response to movements in the mantle.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:5.2 Explain how Earth events, abruptly and over time, can bring about changes on Earth's surface (e.g., landforms, ocean floor, rock features, climate).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:5.3 Explain the role of differential heating or convection in ocean currents, winds, weather and weather patterns, atmosphere, or climate.		
Student Friendly/"I Can..." Statement	Resources	Assessments
ROCK CYCLE		
S:ESS1:8:6.1 Describe the processes of the rock cycle.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:6.2 Explain that sedimentary, igneous, and metamorphic rocks contain evidence of the minerals, temperatures, and forces that created them.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:6.3 Explain how sediments of sand and smaller particles, which may contain the remains of organisms, are gradually buried and		

cemented together by dissolved minerals to form solid rock.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:6.4 Using data about a rock's physical characteristics, make and support an inference about the rock's history and connection to the rock cycle.		
Student Friendly/"I Can..." Statement	Resources	Assessments
WATER		
S:ESS1:8:7.1 Describe how water flows into and through a watershed, falling on the land, collecting in rivers and lakes, soil, and porous layers of rock, until much of it flows back into the ocean.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:7.2 Identify the physical and chemical properties that make water an essential component of the Earth's system.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:8:7.3 Explain the processes that cause cycling of water into and out of the atmosphere and their connections to our planet's weather patterns.		
Student Friendly/"I Can..." Statement	Resources	Assessments

ESS2– The Earth is part of a solar system, made up of distinct parts, which have temporal and spatial interrelationships.

EARTH, SUN, AND MOON

S:ESS2:8:1.1 Identify the characteristics of the Sun and its position in the universe.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:ESS2:8:1.2 Recognize and describe how the regular and predictable motions of the Earth and Moon account for phenomena, such as the phases of the Moon and eclipses.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:ESS2:8:1.3 Recognize the relationships between the tides and the phases of the moon; and use tide charts and NOAA information to describe them.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:ESS2:8:1.4 Explain the temporal or positional relationships between or among the Earth, Sun and Moon (e.g., night/day, seasons, year, tide).

Student Friendly/"I Can..." Statement	Resources	Assessments
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ENERGY

S:ESS2:8:2.1 Describe the Sun as the principle energy source for phenomena on the Earth's surface.

Student Friendly/"I Can..." Statement	Resources	Assessments
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SOLAR SYSTEM

S:ESS2:8:3.1 Identify the characteristics and movement patterns of the planets in our Solar System and differentiate between them.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:ESS2:8:3.2 Explain the effects of gravitational force on the planets and their moons.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS2:8:3.3 Explain why Earth and our Solar System appear to be somewhat unique, while acknowledging recent evidence that suggests similar systems exist in the universe.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS2:8:3.4 Compare and contrast planets based on data provided about size, composition, location, orbital movement, atmosphere, or surface features (includes moons).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS2:8:3.5 Explain how gravitational force affects objects in the Solar System (e.g., moons, tides, orbits, satellites).		
Student Friendly/"I Can..." Statement	Resources	Assessments
VIEW FROM EARTH		
S:ESS2:8:4.1 Explain how technological advances have allowed scientists to re-evaluate or extend existing ideas about the Solar System.		
Student Friendly/"I Can..." Statement	Resources	Assessments

ESS3– The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time.

SIZE AND SCALE		
S:ESS3:8:1.1 Define an astronomical unit as the distance from the Earth to the Sun.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:8:1.2 Explain that special units of measure, such as light years and astronomical units, are used to calculate distances in space		
Student Friendly/"I Can..." Statement	Resources	Assessments
STARS AND GALAXIES		
S:ESS3:8:2.1 Describe objects such as asteroids, comets and meteors in terms of their characteristics and movement patterns.		
Student Friendly/"I Can..." Statement	Resources	Assessments
UNIVERSE		
S:ESS3:8:3.1 Describe the universe as being comprised of billions of galaxies, each containing many billions of stars; and explain that there are vast distances separating these galaxies and stars from one another and from the Earth.		
Student Friendly/"I Can..." Statement	Resources	Assessments

ESS4—The growth of scientific knowledge in Earth Space Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:ESS4:8:1.1 Describe ways in which technology has increased our understanding of the world in which we live.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:8:1.2 Recognize the importance of technology as it relates to science, for purposes such as: access to space and other remote locations, sample collection and treatment, measurement, data collection, and storage, computation, and communication of information.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:ESS4:8:2.1 Calculate temperature in degrees Celsius.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:8:2.2 Perform calculations using metric measurements		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:8:2.3 Describe how man uses land-based light telescopes, radio telescopes, satellites, manned exploration, probes and robots to collect data.		
Student Friendly/"I Can..." Statement	Resources	Assessments
LOCAL AND GLOBAL ENVIRONMENTAL ISSUES		
S:ESS4:8:3.1 Provide examples of how creative thinking and economic need has shaped the way people use natural materials, such as the use of metal ores, petroleum, and fresh water.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:ESS4:8:3.2 Explain how to test natural materials to measure and compare their properties.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:8:3.3 Explain how technologies can reduce the environmental impact of natural disasters.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:8:3.4 Identify the potential impact of converting forested land to uses such as farms, homes, factories, or tourist attractions.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:ESS4:8:4.1 Understand that some scientific jobs/careers involve the application of Earth Space science content knowledge and experience in specific ways that meet the goals of the job.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Life Science

LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

CLASSIFICATION		
S:LS1:8:1.1 Recognize that similarities among organisms are found in anatomical features and patterns of development; and explain how these can be used to infer the degree of relatedness among organisms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define anatomical features • Explain the ways that organisms are alike in their anatomy and in how they develop • Evaluate how closely related organisms are by their similarities 	Resources	Assessments
S:LS1:8:1.2 Describe or compare how different organisms have mechanisms that work in a coordinated way to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance (e.g., cells, tissues, organs and systems).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • List the 6 characteristics of life, giving an example of each • Choose an organism and describe the mechanisms it has to accomplish the six characteristics of life • Compare the mechanisms of life among several organisms 	Resources	Assessments
LIVING THINGS AND ORGANIZATION		
S:LS1:8:2.1 Identify the functions of the human body's systems, including digestion, respiration, reproduction, circulation, excretion, movement, control and coordination and protection from disease; and describe how they interact with one another.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the functions of each body system • Describe how the systems work together to perform body functions 	Resources	Assessments
S:LS1:8:2.2 Define a population and describe the factors that can affect it.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define population 	Resources	Assessments

<ul style="list-style-type: none"> • Identify specific population examples • Investigate things that affect a population • Describe the factors that affect a specific population 		
<p>S:LS1:8:2.3 Explain why it is beneficial for an organism to be able to regulate its internal environment while living in a constantly changing external environment.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Contrast the internal environment of an organism with its external environment • Describe ways that the external environment of an organism may change • Explain homeostasis • Describe ways that an organism can adjust its own internal environment • Explain the effects that the changes in the world around an organism may have on the organism • Generalize the reasons why its important for an organism to adjust its own interior environment based on changes that take place around it 	<p>Resources</p>	<p>Assessments</p>
<p>S:LS1:8:2.4 Explain relationships between or among the structure and function of the cells, tissues, organs, and organ systems in an organism.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define structure • Define function • Define cell, tissue, organ, organ system • Explain how cells, tissues, organs, and organ systems are related to each other 	<p>Resources</p>	<p>Assessments</p>
<p>S:LS1:8:2.5 Using data and observations about the biodiversity of an ecosystem, make predictions or draw conclusions about how the diversity contributes to the stability of the ecosystem.</p>		
<p>Student Friendly/"I Can..." Statement</p>	<p>Resources</p>	<p>Assessments</p>

<ul style="list-style-type: none"> • Define biodiversity • Collect data and make observations about the biodiversity of an ecosystem • Describe a stable ecosystem • Predict how biodiversity adds to the stability of an ecosystem 		
REPRODUCTION		
S:LS1:8:3.1 Differentiate between asexual and sexual reproduction, and explain that in some kinds of organisms, all the genes come from one parent, while in organisms requiring two sexes to reproduce, typically half the genes come from each parent.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define asexual reproduction • Define sexual reproduction • Describe where the genes come from in different types of organisms • Explain the differences between asexual and sexual reproduction 	Resources	Assessments
S:LS1:8:3.2 Explain that a species of sexually reproducing organisms is comprised of all the organisms that can mate to produce fertile offspring.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define a species • Define fertile offspring • Explain how organisms are classified into a species category 	Resources	Assessments
S:LS1:8:3.3 Explain that in sexual reproduction, a single specialized cell from a female merges with a specialized cell from a male in a process called fertilization.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define reproduction • Define fertilization • Describe the special cells formed by male and female organisms for reproduction • Explain the process the cells go through during fertilization 	Resources	Assessments
S:LS1:8:3.5 Explain how the basic tissues of an embryo form.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ul style="list-style-type: none"> • Define embryo • Define tissue • Explain the stage of development from fertilization to embryo 		
S:LS1:8:3.6 Compare and contrast sexual reproduction with asexual reproduction.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define asexual reproduction • Define sexual reproduction • Compare asexual and sexual reproduction • Contrast asexual and sexual reproduction 	Resources	Assessments
S:LS1:8:3.7 Using data provided, select evidence that supports the concept that genetic information is passed on from both parents to offspring.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define evidence • Describe genetic information • Choose evidence that shows that genetic information comes from both parents 	Resources	Assessments

LS2– Energy flows and matter recycles through an ecosystem.

ENVIRONMENT		
S:LS2:8:1.1 Explain how changes in environmental conditions can affect the survival of individual organisms and an entire species.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:1.2 Explain that in all environments, organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter, and that in any particular environment the growth and survival of organisms depend on the physical conditions.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:1.3 Using data and observations, predict outcomes when abiotic/biotic factors are changed in an ecosystem.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define abiotic and biotic • List abiotic and biotic factors in an ecosystem • Determine which abiotic and biotic factors could change • Predict the changes in an ecosystem when abiotic or biotic factors are changed 	Resources	Assessments
FLOW OF ENERGY		
S:LS2:8:2.1 Explain how food provides energy and materials for growth and repair of body parts.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:2.2 Given a scenario, trace the flow of energy through an ecosystem, beginning with the sun, through organisms in the food web, and into the environment (includes photosynthesis and respiration).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Draw a food web • Explain what organisms use energy for • Define photosynthesis and respiration 	Resources	Assessments

<ul style="list-style-type: none"> • Explain what part photosynthesis and respiration play in the flow of energy • Show how energy flows through an ecosystem including sun, food web, and the environment 		
RECYCLING OF MATERIALS		
S:LS2:8:3.1 Identify autotrophs as producers who may use photosynthesis, and describe this as the basis of the food web.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:3.2 Explain the process of respiration and differentiate between it and photosynthesis.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:3.3 Know that all organisms, including humans, are part of, and depend on, two main interconnected global food webs: one which includes microscopic ocean plants, and the other which includes land plants.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:3.4 Describe how matter is recycled within ecosystems and explain that the total amount of matter remains the same, though its form and location change.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:3.5 Identify carbon, hydrogen, oxygen, nitrogen and phosphorus as common elements of living matter.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS2:8:3.6 Given an ecosystem, trace how matter cycles among and between organisms and the physical environment (includes water, oxygen, food web, decomposition and recycling, but not carbon cycle nor nitrogen cycle).		
Student Friendly/"I Can..." Statement	Resources	Assessments

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|---|--|--|
| <ul style="list-style-type: none">• Define matter• Define food web• Define physical environment• Summarize the way that matter moves from one part of the environment to another | | |
|---|--|--|

LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry).

CHANGE		
S:LS3:8:1.1 Describe the type of impact certain environmental changes, including deforestation, invasive species, increased erosion, and pollution containing toxic substances, could have on local environments.		
Student Friendly/"I Can..." Statement	Resources	Assessments
EVIDENCE OF EVOLUTION		
S:LS3:8:2.1 Describe how the fossil record provides geologic evidence verifying the existence of now extinct life forms, and explains how this evidence provides documented proof of their appearance, diversification and extinction.		
S:LS3:8:2.2 Explain the concept of extinction and describes its importance in biological evolution.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:8:2.3 Use a model, classification system, or dichotomous key to illustrate, compare, or interpret possible relationships among groups of organisms (e.g., internal and external structures, anatomical features).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define dichotomous key • Describe how organisms are classified • Use my tools to describe how groups of organisms are similar or different from each other 	Resources	Assessments
NATURAL SELECTION		
S:LS3:8:3.1 Recognize that hereditary information is contained in genes, which are located in the chromosomes of each cell; and explain that inherited traits can be determined by either one or many genes, and that a single gene can influence more than one trait, such as eye and hair color.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:8:3.2 Recognize that in any given environment the growth and survival of organisms depend on the physical conditions that exist; and explain that in all environments, organisms with similar needs may compete with one another for resources, including food, space, water, air, and		

shelter.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:8:3.3 Explain how individual organisms with certain traits are more likely than others to survive and have offspring.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:8:3.4 Recognize that humans are able to control some characteristics of plants and animals through selective breeding; and explain how this results in small differences between the parents and offspring, which can accumulate in successive generations so that decedents are very different from their ancestors.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:8:3.5 Cite examples supporting the concept that certain traits of organisms may provide a survival advantage in a specific environment and therefore, an increased likelihood to produce offspring.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define traits • Describe characteristics of organisms that could help it survive in an environment • Define survival advantage • Define offspring • Explain how increasing the chances of surviving will increase the chances of an organism producing offspring • Give examples of types of characteristics that help an organism survive and produce offspring 	Resources	Assessments

LS4– Humans are similar to other species in many ways, and yet are unique among Earth’s life forms.

BEHAVIOR		
S:LS4:8:1.1 Recognize that unlike human beings, behavior in insects and many other species is determined almost entirely by biological inheritance.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:8:1.2 Explain that organism’s behavioral response is a reaction to internal or and environmental stimuli, and that these responses may be determined by heredity or from past experience.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:8:1.3 Explain how all behavior is affected by both inheritance and experience.		
Student Friendly/"I Can..." Statement	Resources	Assessments
DISEASE		
S:LS4:8:2.1 Recognize that disease in organisms can be caused by intrinsic failures of the system or infection from other organisms.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:8:2.2 Describe how viruses, bacteria, fungi, and parasites may affect the human body and provide examples of how they can interfere with normal body function.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:8:2.3 Describe the function of white blood cells and explain how they support the body’s defense system.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:LS4:8:2.4 Use data and observations to support the concept that environmental or biological factors affect human body systems (biotic and abiotic).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define biotic • Define abiotic • Describe ways that environmental factors may affect human body systems • Describe ways that biological factors may affect human body systems • Give examples from data and observations that show how environmental and biological factors affect human body systems 	Resources	Assessments
HUMAN IDENTITY		
S:LS4:8:3.1 Compare patterns of human development with those of other vertebrates.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:8:3.2 Recognize that an organism can be described in terms of a combination of traits; and differentiate between inherited traits and those that result from interactions with the environment.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:8:3.3 Describe the major changes that occur over time in human development from single cell through embryonic development to new born (i.e., group of cells during the first trimester, organs form during the second, organs mature during the third).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the sequence of events that happen as a human develops from a cell to a newborn 	Resources	Assessments
S:LS4:8:3.4 Using data provided, select evidence that supports the concept that genetic information is passed on from both parents to offspring		
Student Friendly/"I Can..." Statement	Resources	Assessments

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LS5– The growth of scientific knowledge in Life Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:LS5:8:1.1 Explain how technology has influenced the course of history, and provide examples such as those that relate to agriculture, sanitation and medicine.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:8:1.2 Provide examples of ways technology is used to protect the environment, such as using bacteria to clean water.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:LS5:8:2.1 Recognize and provide examples of how technology has enhanced the study of life sciences, as in the development of advanced diagnosing equipment improving medicine.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
MEDICAL TECHNOLOGY		
BIOTECHNOLOGY		
S:LS5:8:3.1 Explain the necessity of and purpose for the proper disposal of medical products.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:8:3.2 Give examples of how increased understanding of biology has led to improvements in biotechnology, such as scientific methods for increasing the yield or the pest-resistance of important food crops.		
Student Friendly/"I Can..." Statement	Resources	Assessments

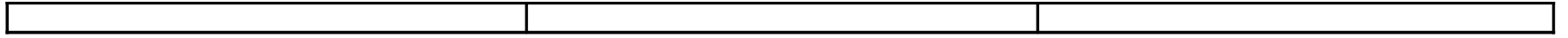
S:LS5:8:3.3 Describes ways biotechnology helps humans, including improved health and medicine.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:LS5:8:4.1 Understand that some scientific jobs/careers involve the application of life science content knowledge and experience in specific ways that meet the goals of the job.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define career • Define life science • Investigate careers or jobs that require knowledge of life science 	Resources	Assessments

Physical Science

PS1– All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size/amount of substance).

COMPOSITION		
S:PS1:8:1.1 Explain that atoms often combine to form a molecule or formula unit (crystal).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:1.2 Recognize that elements can combine in a variety of ways to form compounds.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:1.3 Differentiate between an atom and an molecule.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:1.4 Differentiate between a mixture and a pure substance.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:1.5 Identify methods used to separate mixtures, such as boiling, filtering, chromatography and screening.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:1.6 Collect data or use data provided to infer or predict that the total amount of mass in a closed system stays the same, regardless of how substances interact		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:PS1:8:1.7 Given graphic or written information, classify matter as atom/molecule or element/compound (not the structure of an atom).		
Student Friendly/"I Can..." Statement	Resources	Assessments
PROPERTIES		
S:PS1:8:2.1 Differentiate between volume and mass and define density.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:2.2 Explain how different substances of equal volume usually have different weights.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:2.3 Identify a molecule as the smallest part of a substance that retains its properties.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:2.4 Investigate the relationships among mass, volume and density.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:2.5 Given data about characteristic properties of matter (e.g., melting and boiling points, density, solubility), identify, compare, or classify different substances.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS1:8:2.6 Represent or explain the relationship between or among energy, molecular motion, temperature, and states of matter.		
Student Friendly/"I Can..." Statement	Resources	Assessments



PS2– Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.

CHANGE		
S:PS2:8:1.1 Explain how substances react chemically with other substances to form new substances, known as compounds, and that in such recombinations, the properties of the new substances may be very different from those of the old.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:1.2 Identify factors that affect reaction rates, such as temperature, concentration and surface area; and explain that dissolving substances in liquids often accelerates reaction rates.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:1.3 Explain that oxidation involves combining oxygen with another substance, as in burning or rusting.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:1.4 Explain that states of matter depend on the arrangement of the molecules and their motion.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:1.5 Given a real-world example, show that within a system, energy transforms from one form to another (i.e., chemical, heat, electrical, gravitational, light, sound, mechanical).		
Student Friendly/"I Can..." Statement	Resources	Assessments
CONSERVATION		
S:PS2:8:2.1 Explain the law of conservation of energy.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:PS2:8:2.2 Collect data or use data provided to infer or predict that the total amount of mass in a closed system stays the same, regardless of how substances interact (conservation of matter).		
Student Friendly/"I Can..." Statement	Resources	Assessments
ENERGY		
S:PS2:8:3.1 Differentiate between kinetic energy, which is the energy of motion and potential energy, which depends on relative position.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:3.2 Recognize the Sun is a major energy source for the Earth, and describes how it affects the planet's surface.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:3.3 Describe ways light can interact with matter, such as transmission (which includes refraction), absorption, and scattering (which includes reflection).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:3.4 Explain that the human eye can only detect wavelengths of electromagnetic radiation within a narrow range; and explain that the differences of wavelength within that range of visible light are perceived as differences in color.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:3.5 Recognize that most chemical and nuclear reactions involve a transfer of energy.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS2:8:3.6 Use data to draw conclusions about how heat can be transferred (convection, conduction, radiation).		

Student Friendly/"I Can..." Statement	Resources	Assessments
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PS3– The motion of an object is affected by force.

FORCES

S:PS3:8:1.1 Explain that the force of gravity gets stronger the closer one gets to an object and decreases the further away one gets from it.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:PS3:8:1.2 Recognize the general concepts related to gravitational force.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:PS3:8:1.3 Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.

Student Friendly/"I Can..." Statement	Resources	Assessments
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MOTION

S:PS3:8:2.1 Explain that an object in motion that is unaffected by a force will continue to move at a constant speed and in a straight line.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:PS3:8:2.2 Explain how the motion of an object can be described by its position, direction of motion, and speed; and illustrate how that motion can be measured and represented graphically.

Student Friendly/"I Can..." Statement	Resources	Assessments
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PS4– The growth of scientific knowledge in Physical Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:PS4:8:1.1 Understand that design features, such as size shape, weight, and function, must be considered when designing new technology.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:PS4:8:2.1 Demonstrate appropriate use of tools, such as rulers, calculators, balances, and graduated cylinders to measure and calculate volume and mass.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
ENERGY, POWER, AND TRANSPORTATION		
MANUFACTURING		
S:PS4:8:3.1 Explain how humans use natural resources, such as flowing water and burning of coal, oil, or natural gas to generate electrical energy in power plants.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS4:8:3.2 Describe how natural resources, such as coal, oil and natural gas are tapped for use in power plants, and how alternative sources, such as solar, wind, water, nuclear are tapped for power; and compare the advantages and disadvantages of each source.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:PS4:8:3.3 Differentiate between durable goods, which are designed to operate for a long period of time, and non-durable goods, which are only intended to operate for a short period of time.		
Student Friendly/"I Can..." Statement	Resources	Assessments

CAREER TECHNICAL EDUCATION CONNECTIONS		
S:PS4:8:4.1 Understand that some scientific jobs/careers involve the application of physical science content knowledge and experience in specific ways that meet the goals of the job.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Measurement Specifics for Science

(Adapted from NECAP Mathematics Assessment GLEs grades 3-8)

The following is a list of the measurement benchmarks and equivalences that **can be used** in mathematics problems across the science domains at each specific grade. In addition to measurement benchmarks identified below students should be expected to use the appropriate units when solving problems involving area, volume, surface area, conversions, and rates (e.g., miles per hour, price per pound, and pounds per square inch) in science.

Connection to the Mathematics GLEs is **M:G&M:2.7 (Uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands.)**

Measures	By Grade 2	By Grade 4	End of Grade 8
Length	<p>Unit (accuracy): Inch (to whole inch); Foot (to whole inch); Centimeter (to whole centimeter); Meter (to whole centimeter)</p> <p>Equivalencies: 12 inches in 1 foot; 100 centimeters in 1 meter</p>	<p>Unit (accuracy): Inch (to 1/4 inch); Foot; Centimeter (to 0.5 centimeter); Meter (to 0.5 centimeter); Yard; Mile (use in scale questions); Kilometer (use in scale questions)</p> <p>Equivalencies: 12 inches in 1 foot; 100 centimeters in 1 meter; 3 feet in 1 yard; 36 inches in 1 yard</p>	<p>Units (accuracy): Inch (to 1/16 inch); Foot; Centimeter (to 1/10 centimeter); Meter (to 1/100 meter); Yard; Mile (use in scale and rate questions); Kilometer (use in scale and rate questions)</p> <p>Equivalencies: 12 inches in 1 foot; 100 centimeters in 1 meter; 3 feet in 1 yard; 36 inches in 1 yard; 10 millimeters in 1 centimeter; 1000 millimeters in 1 meter</p>
Time	<p>Unit (accuracy): Hour (to 15 minute interval)</p> <p>Equivalencies: 60 minutes in 1 hour</p>	<p>Unit (accuracy): Hour (to 5 minute interval); Day; Year</p> <p>Equivalencies: 24 hours in 1 day; 7 days in 1 week; 365 days in 1 year; 60 seconds in 1 minute; 60 minutes in 1 hour</p>	<p>Unit (accuracy): Hour (to 1 minute); Day; Year</p> <p>Equivalencies: 24 hours in 1 day; 7 days in 1 week; 365 days in 1 year; 60 seconds in 1 minute; 60 minutes in 1 hour</p>
Temperature	<p>Unit (accuracy): Degree (to 1 degree)</p>	<p>Unit (accuracy): °C and °F (to 1 degree)</p>	<p>Unit (accuracy): °C and °F (to 1 degree)</p>
Capacity		<p>Unit (accuracy): Quart (to whole quart)</p>	<p>Unit (accuracy): Quarts (to 1 ounce); Gallon; Pint; Liter</p> <p>Equivalencies: 32 ounces in 1 quart; 4 quarts in 1 gallon; 2 pints in 1 quart; 1000 milliliters in 1 liter</p>
Mass		<p>Unit (accuracy): Kilogram (to whole kilogram); Gram (to whole gram)</p>	<p>Unit (accuracy): Kilogram; Gram (to 1/10 gram)</p>
Weight		<p>Unit (accuracy): Pound (to whole pound)</p>	<p>Unit (accuracy): Pound (to 1 ounce)</p> <p>Equivalencies: 16 ounces in 1 pound</p>
Angles and Rotation			<p>Unit (accuracy): Degree (to 2 degrees)</p> <p>Equivalencies: 360° in 1 circle; 90° in 1 right angle</p>

9 – 12

HIGH SCHOOL – GRADES 9 to 12
REFINING, ENRICHING, AND APPLYING KEY SCIENCE CONCEPTS

It is important that students develop a solid understanding of how specific domains of science operate. Students in high school should learn science in courses with clear content goals and expectations. Understanding the connections of one science domain to another is important but research indicates students need concentrated knowledge and skills in specific science domains.

Courses become more content-intensive without losing the field, experiential, and laboratory components. Although content may take on a more prominent role, instruction should proceed as much as possible on an inquiry basis. Alternative paths may exist to serve increasingly divergent student needs.

- Use formal controlled experimentation to gather data about the natural world. Limit scope, isolate variables, prove or disprove a limited hypothesis.
- Generate their own questions, develop hypotheses, and design or modify experiments to test those hypotheses.
- Manipulate scientific apparatus and use advanced technology to gather data (e.g., air tracks, electrophoresis, lasers, titration glassware.)
- Analyze collected data to validate or refute a hypothesis.
- Articulate clearly and defend a scientific viewpoint.

The importance of linking science content to student lives can not be overemphasized. The ability of students to link new content to their personal science knowledge is critical for students to understand and remember concepts. Collaboration in science as a critical process will be fostered in the classroom. In addition, an increased use of quantitative reasoning should occur throughout high school.

**End of Grade 11
Process Skills**

Scientific Inquiry and Critical thinking Skills

MAKING OBSERVATIONS AND ASKING QUESTIONS		
S:SPS1:11:1.1 Ask questions about relationships among variables that can be observed directly as well as those that cannot.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define variables that can be observed directly • Define variables that cannot be observed directly • Ask questions about the ways that observable variables are related • Ask questions about the ways that unobservable variables are related 	Resources	Assessments
S:SPS1:11:1.2 Use complex classification criteria and keys to identify items/organisms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe methods that we use to classify items or organisms • Compare items or organisms to a key or other classification system • Use classification methods to identify items/organisms 	Resources	Assessments
S:SPS1:11:1.3 Evaluate complex methods of classification for a specific purpose.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • 	Resources	Assessments
S:SPS1:11:1.4 Identify limitations of a given classification system and identify alternative ways of classifying to accommodate anomalies.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe anomalies that occur in classifying • Describe ways that a classification system may not be the best choice • Identify other ways to classify items or 	Resources	Assessments

organisms when a particular method doesn't work		
DESIGNING SCIENTIFIC INVESTIGATIONS		
S:SPS1:11:2.1 Apply scientific theories and laws to new situations to generate hypotheses.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define hypothesis • Use my knowledge of scientific theories and laws to come up with a hypothesis in a new situation 	Resources	Assessments
S:SPS1:11:2.2 State a hypothesis and prediction based on available evidence and background information.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Gather evidence and observations about a situation • Form a hypothesis from my observations • Predict the outcome of my hypothesis 	Resources	Assessments
CONDUCTING SCIENTIFIC INVESTIGATIONS		
S:SPS1:11:3.1 Select and use apparatus and material safely.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the uses of various scientific apparatus • Choose the appropriate scientific tools • Show that I can work in a lab safely 	Resources	Assessments
S:SPS1:11:3.2 Use instruments effectively and accurately for collecting data.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Operate science tools correctly when collecting data 	Resources	Assessments
S:SPS1:11:3.3 Compile and organize data, using appropriate units.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Collect data with correct units • Organize data to make sense of it 	Resources	Assessments
REPRESENTING AND UNDERSTANDING RESULTS OF INVESTIGATIONS		

S:SPS1:11:4.1 Compile and display data, evidence and information by hand and computer, in a variety of formats, including diagrams, flow charts, tables, graphs and scatter plots.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Make diagrams or flow charts to display data correctly • Create tables for data by hand or on the computer • Create graphs and scatter plots correctly by hand or on the computer 	Resources	Assessments
EVALUATING SCIENTIFIC EXPLANATIONS		
S:SPS1:11:5.1 Explain how data support or refute the hypothesis or prediction.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Analyze my data to see what it shows • Determine whether data supports my claim or proves it wrong 	Resources	Assessments
S:SPS1:11:5.2 Provide a statement that addresses and answers the question investigated in light of the evidence generated in the investigation.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain what the question is in an investigation • Collect evidence in an investigation • Use my evidence to write a response to the question in an investigation 	Resources	Assessments

Unifying Concepts of Science

NATURE OF SCIENCE (NOS)		
S:SPS2:11:1.1 Explore new phenomena through investigations conducted for different reasons, or to check on previous results.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Set up an investigation • Work through the steps of an investigation • Evaluate what I have learned through an investigation 	Resources	Assessments
S:SPS2:11:1.2 Test how well a theory predicts a phenomena.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Conduct experiments or investigations about a given theory • Evaluate whether the predictions of the theory are correct or not 	Resources	Assessments
S:SPS2:11:1.3 Recognize that sometimes scientists can control conditions in order to focus on the effect of a single variable; when that is not possible for practical or ethical reasons, they try to observe as wide a range of natural occurrences as possible to be able to discern patterns.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the conditions of an experiment • Describe the variables in an experiment • Describe ways that the conditions of an experiment can be controlled so that a single variable can be studied • Explain the reasons that it may not be possible to control the conditions of an experiment • Summarize ways scientists use to find as much information about a variable as possible 	Resources	Assessments
S:SPS2:11:1.4 Show how hypotheses are widely used in science for choosing what data to pay attention to and what additional data to seek, and for guiding the interpretation of the data (both new and previously available).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define a hypothesis 	Resources	Assessments

<ul style="list-style-type: none"> • Explain how a hypothesis is developed • Explain how a hypothesis can focus the scientists' attention on what is most important in a situation 		
S:SPS2:11:1.5 Understand that in the long run, theories are judged by how they fit with other theories, the range of observations they explain, how well they explain observations, and how effective they are in predicting new findings.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Evaluate how well a theory fits in with other known theories • Evaluate how well a theory explains a wide variety of observations • Evaluate how well a theory can predict new results • Explain the ways that a theory is judged for its usefulness 	Resources	Assessments
S:SPS2:11:1.6 Show how the usefulness of a model can be tested by comparing its predictions to actual observations in the real world; but a close match does not mean that the model is the only "true" model or the one that would work.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Evaluate the usefulness of scientific models by comparing them to observations in the real world • Explain that just because a model seems to be accurate, it may not be the only one that would work 	Resources	Assessments
S:SPS2:11:1.7 Realize that in science, the testing, revising, and occasional discarding of theories, new and old, never ends; this ongoing process leads to an increasingly better understanding of how things work in the world but not to absolute truth.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the process of testing and revising scientific thought • Explain that any theory or law could be revised if needed 	Resources	Assessments
SYSTEMS AND ENERGY (SAE)		
S:SPS2:11:2.1 Realize that systems may be so closely related that there is no way to draw boundaries that separate all parts of one from all parts of the others.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Evaluate and describe the 	Resources	Assessments

<ul style="list-style-type: none"> relationships between systems Explain that some systems can't be totally separated from others because they are so close 		
S:SPS2:11:2.2 Give examples to show that a system usually has some properties that are different from those of its parts, but appear because of the interaction of those parts.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> 	Resources	Assessments
S:SPS2:11:2.3 Demonstrate that even in some very simple systems, it may not always be possible to predict accurately the result of changing some part or connection.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> 	Resources	Assessments
MODELS AND SCALE (MAS)		
S:SPS2:11:3.1 Understand that the basic idea of mathematical modeling is to find a mathematical relationship that behaves in the same way as the objects or processes under investigation; a mathematical model may give insight about how something really works or may fit observations very well without any intuitive meaning.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Analyze data and observations to find a mathematical relationship that describes a process Explain the purpose of finding a mathematical relationship for a process – it may explain why the process works, or it may just represent the process well 	Resources	Assessments
PATTERNS OF CHANGE (POC)		
S:SPS2:11:4.1 Recognize that things can change in detail, but remain the same in general (e.g., the players change but the team remains, the cells are replaced but the organism remains); sometimes counterbalancing changes are necessary for a thing to retain its essential constancy in the presence of changing conditions.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Recognize that even though the details of something may change, its identity 	Resources	Assessments

may stay the same		
S:SPS2:11:4.2 Describe how graphs and equations are useful (and often equivalent) ways for depicting and analyzing patterns of change.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Use graphs to show data • Identify equations that represent graphs of data • Show how graphs or equations can be used to describe a pattern 	Resources	Assessments
S:SPS2:11:4.3 Give examples of how a system in equilibrium may return to the same state of equilibrium if the disturbances it experiences are small; but large disturbances may cause it to escape that equilibrium and eventually settle into some other state of equilibrium.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain what a system in equilibrium is • Define a disturbance to a system • Evaluate the results of small disturbances to a system and of large disturbances to a system • Give examples of ways that small disturbances don't change the equilibrium of a system • Give examples of ways that large disturbances affect a system, but it still reaches equilibrium 	Resources	Assessments
S:SPS2:11:4.4 Describe how in evolutionary change, the present arises from the materials and forms of the past, more or less gradually, and in ways that can be explained.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe evolutionary change • Describe ways that gradual changes in past materials can explain the present conditions 	Resources	Assessments
FORM AND FUNCTION (FAF)		
S:SPS2:11:5.1 Explore how the movement of ocean floor plates under continental plates or two continental plates moving against each other can deform the earth's surface.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the ocean floor plates • Describe the continental plates 	Resources	Assessments

<ul style="list-style-type: none"> Investigate the results of moving ocean floor plates under continental plates Investigate the results of moving two continental plates against each other Explain how the earth's surface changes when the tectonic plates move 		
S:SPS2:11:5.2 Provide data and evidence on how folding in crustal plates can cause mountain ranges.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Describe the plates in the earth's crust Describe the process of folding of the plates that results in mountain ranges Investigate and gather data about folding in earth's crust Use evidence to explain how folding in the plates in earth's crust produces mountain ranges 	Resources	Assessments
S:SPS2:11:5.3 Understand that an atom's electron configuration determines how the atom can interact with other atoms.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Describe the electron configuration of an atom Explain the ways atoms behave for various types of electron configurations Give examples that show how the electron configuration of an atom affects how it behaves around other atoms 	Resources	Assessments
S:SPS2:11:5.4 Provide examples of how configuration of atoms in a molecule determines a molecule's properties.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Determine the electron configuration of a molecule Explain the connection between electron configuration and properties of atoms 	Resources	Assessments

<ul style="list-style-type: none"> • Describe ionically bonded substances • Describe covalently bonded substances • Give examples of ionically bonded molecules and describe their properties • Give examples of covalently bonded molecules and describe their properties 		
S:SPS2:11:5.5 Discover how the shape of large molecules affects the interaction with other molecules.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • 	Resources	Assessments
S:SPS2:11:5.6 Demonstrate that a variety of biological, chemical and physical phenomena can be explained by changes in the arrangement and motion of atoms and molecules.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • 	Resources	Assessments

Personal, Social, and Technological Perspectives

COLLABORATION IN SCIENTIFIC ENDEAVORS		
S:SPS3:11:1.1 Collaborate with existing research efforts.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate current research projects globally or locally Discover ways that I can be involved in science research 	Resources	Assessments
S:SPS3:11:1.2 Identify global researchers in a field of interest.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate scientists who are doing global research Choose a particular field of interest and discover who the leading researchers are 	Resources	Assessments
COMMON ENVIRONMENTAL ISSUES, NATURAL RESOURCES MANAGEMENT AND CONSERVATION		
S:SPS3:11:2.1 Develop, modify, clarify and explain questions that guide environmental investigations of various types.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:2.2 Design investigations to answer particular questions about the environment.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:2.3 Locate and collect reliable information for environmental investigations of many types.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:2.4 Apply basic logic and reasoning skills to evaluate completeness and reliability in a variety of information sources.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS3:11:2.5 Organize and display information in ways appropriate to different types of environmental investigations and purposes.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:2.6 Create, use and evaluate models to understand environmental phenomena.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:2.7 Use to evidence and logic in developing proposed explanations that address their initial questions and hypotheses.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:2.8 Analyze global, social, cultural, political, economic and environmental linkages.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:2.9 Evaluate presentations of environmental issues for accuracy.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SCIENCE AND TECHNOLOGY, TECHNOLOGICAL DESIGN AND APPLICATION		
S:SPS3:11:3.1 Analyze environmental issues such as water quality, air quality, hazardous waste, and depletion of natural resources.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS3:11:3.2 Evaluate status of a local community system (transportation, water, communication, food resources or electrical) in partnership with local officials.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:SPS3:11:3.3 Analyze technical writing, graphs, charts, and diagrams.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Science Skills for Information, Communication and Media Literacy

INFORMATION AND MEDIA LITERACY		
S:SPS4:12:1.1 Select and analyze information from various sources (including electronic resources, print resources, community resources) and personally collected data to answer questions being investigated.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:12:1.2 Collect and use qualitative and quantitative data and information, seek evidence and sources of information to identify flaws such as errors and bias, and explain how the evidence supports or refutes an initial hypothesis.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:12:1.3 Analyze data and information gathered to clarify problems or issues identifying costs and benefits from a social, cultural, and/or environmental perspective; predict the consequences of action or inaction; and propose possible solutions.		
Student Friendly/"I Can..." Statement	Resources	Assessments
COMMUNICATION SKILLS		
S:SPS4:12:2.1 Select and use appropriate scientific vocabulary to orally share and communicate scientific ideas, plans, results, and conclusions resulting from investigations.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Use correct scientific vocabulary to discuss scientific ideas • Talk about scientific ideas with my class 	Resources	Assessments
S:SPS4:12:2.2 Create written reports and journals to share and communicate scientific ideas, plans, results, and conclusions resulting from observations and investigations.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Write about scientific ideas using correct vocabulary 	Resources	Assessments
S:SPS4:12:2.3 Create a multimedia presentation incorporating numeric symbolic and/or graphic modes of representation to share scientific ideas, plans, results, and conclusions.		

Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Use technology to create presentations or other media to share scientific ideas 	Resources	Assessments
CRITICAL THINKING AND SYSTEMS THINKING		
S:SPS4:12:3.1 Pursue scientific inquiry such as observation, measurement, hypothesis formation and analysis, and value "habits of mind" such as persistence, accuracy, and collaboration.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define scientific inquiry • Use my inquiry skills to observe, measure, form hypotheses and analyze data • Be persistent • Be accurate • Work together 	Resources	Assessments
S:SPS4:12:3.2 Generate solutions to scientific questions and challenges through developing, modeling and revising investigations.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • 	Resources	Assessments
S:SPS4:12:3.3 Apply scientific knowledge and skills to make reasoned decisions about the use of science and scientific innovations.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • 	Resources	Assessments
PROBLEM IDENTIFICATION, FORMULATION, AND SOLUTION		
S:SPS4:12:4.1 Formulate scientific questions about an issue and define experimental procedures for finding answers.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • 	Resources	Assessments
S:SPS4:12:4.2 Plan and conduct practical tests to solve problems or answer a question, collect and analyze data using appropriate instruments and techniques safely and accurately.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • 	Resources	Assessments

S:SPS4:12:4.3 Develop models and explanations to fit evidence obtained through investigations.		
Student Friendly/"I Can..." Statement •	Resources	Assessments
CREATIVITY AND INTELLECTUAL CURIOSITY		
S:SPS4:12:5.1 Prepare multimedia presentations to share results of investigations, demonstrating a clear sense of audience and purpose.		
Student Friendly/"I Can..." Statement •	Resources	Assessments
S:SPS4:12:5.2 Use electronic networks to share information.		
Student Friendly/"I Can..." Statement •	Resources	Assessments
S:SPS4:12:5.3 Model solutions to a range of problems in science and technology using computer simulation software.		
Student Friendly/"I Can..." Statement •	Resources	Assessments
INTERPERSONAL AND COLLABORATIVE SKILLS		
S:SPS4:12:6.1 Create a culminating team project that demonstrates content knowledge and conceptual understanding and shows connections between science content and real-world settings.		
Student Friendly/"I Can..." Statement •	Resources	Assessments
S:SPS4:12:6.2 Collect, synthesize, and report information from a variety of points of view.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SELF DIRECTION		
S:SPS4:12:7.1 Use key ideas of science to document and explain through an investigation the relationship between science and concepts.		

Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:12:7.2 Self-assess progress toward a predetermined outcome and decide what needs to be done to meet the goal.		
Student Friendly/"I Can..." Statement	Resources	Assessments
ACCOUNTABILITY AND ADAPTABILITY		
S:SPS4:12:8.1 Identify the reputable and appropriate communities of learners to whom research findings should be reported, compare data, and adapt as needed.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:SPS4:12:8.2 Use science learned to create a personal action plan on a community issue.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOCIAL RESPONSIBILITY		
S:SPS4:12:9.1 Collaborate with interested learners using appropriate web resources and publication media such as journals (print and electronic).		
Student Friendly/"I Can..." Statement	Resources	Assessments

Earth Space Science

ESS1– The Earth and Earth materials, as we know them today, have developed over long periods of time, through constant change processes.

ATMOSPHERE, CLIMATE, AND WEATHER		
S:ESS1:11:1.1 Explain how winds and ocean currents are created on the Earth’s surface.		
Student Friendly/”I Can...” Statement	Resources	Assessments
S:ESS1:11:1.2 Explain how heat and energy transfer in and out of the atmosphere; and provide examples of how it is related to weather and climate.		
Student Friendly/”I Can...” Statement	Resources	Assessments
S:ESS1:11:1.3 Describe how Earth’s atmospheric composition has changed from the formation of the Earth through current time.		
Student Friendly/”I Can...” Statement	Resources	Assessments
S:ESS1:11:1.4 Explain how Earth’s features can affect wind and weather patterns by causing air to rise and increasing precipitation.		
Student Friendly/”I Can...” Statement	Resources	Assessments
COMPOSITION AND FEATURES		
S:ESS1:11:2.1 Recognize that elements exist in fixed amounts and describe how they move through the solid Earth, oceans, atmosphere, and living things as part of geochemical cycles, such as the water, carbon and nitrogen cycles.		
Student Friendly/”I Can...” Statement	Resources	Assessments
S:ESS1:11:2.2 Describe the conditions that enable the Earth to support life, such as the availability of water, the gravitational force, the electromagnetic field and the intensity of radiation from the Sun.		
Student Friendly/”I Can...” Statement	Resources	Assessments

S:ESS1:11:2.3 Explain the theory of plate tectonics.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:11:2.4 Describe the movement of crustal plates and explain how the effects have altered the Earth's features.		
Student Friendly/"I Can..." Statement	Resources	Assessments
FOSSILS AND GEOLOGIC TIME		
S:ESS1:11:3.1 Identify and describe the methods used to measure geologic time, such as fossil identification, radioactive dating, and rock sequences.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:11:3.2 Relate how geologic time is determined using various dating methods (e.g., radioactive decay, rock sequences, fossil records).		
Student Friendly/"I Can..." Statement	Resources	Assessments
OBSERVATION OF THE EARTH FROM SPACE		
S:ESS1:11:4.1 Provided with geologic data (including movement of plates) on a given locale, predict the likelihood for an earth event (e.g. volcanoes mountain ranges, islands, earthquakes, tides, tsunamis).		
Student Friendly/"I Can..." Statement	Resources	Assessments
PROCESSES AND RATES OF CHANGE		
S:ESS1:11:5.1 Explain that the Earth is composed of interactive layers, which have distinct compositions, physical properties and processes.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:ESS1:11:5.2 Relate plate movement to earthquakes and volcanic activity, and explain how it results in tectonic uplift and mountain building.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:11:5.3 Identify and describe the major external and internal sources of energy on Earth.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:11:5.4 Provide supporting geologic/geographic evidence that supports the validity of the theory of plate		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:11:5.5 Trace the development of the theory of plate tectonics.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS1:11:5.6 Explain how internal and external sources of heat (energy) fuel geologic processes (e.g., rock cycle, plate tectonics, sea floor spreading).		
Student Friendly/"I Can..." Statement	Resources	Assessments
ROCK CYCLE		
S:ESS1:11:6.1 Explain that throughout the rock cycle, the total amount of the material remains the same.		
Student Friendly/"I Can..." Statement	Resources	Assessments
WATER		
S:ESS1:11:7.1 Explain that water quality can be affected positively or negatively by outside sources.		

Student Friendly/"I Can..." Statement	Resources	Assessments
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ESS2– The Earth is part of a solar system, made up of distinct parts, which have temporal and spatial interrelationships.

EARTH, SUN, AND MOON		
S:ESS2:11:1.1 Explain how the Earth, Moon and Sun were formed.		
Student Friendly/"I Can..." Statement	Resources	Assessments
ENERGY		
S:ESS2:11:2.1 Identify the Earth's major external source of energy as solar energy.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS2:11:2.2 Explain how the inclination of incoming solar radiation can impact the amount of energy Earth receives on any given surface area.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS2:11:2.3 Explain how internal and external sources of heat (energy) fuel geologic processes (e.g., rock cycle, plate tectonics, sea floor spreading).		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOLAR SYSTEM		
S:ESS2:11:3.1 Explain how gravitational force influenced the formations of the planets and their moons; and describe how these objects move in patterns under its continued influence.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS2:11:3.2 Explain how the Solar System formed from a giant cloud of gas and debris about 5 billion years ago.		
Student Friendly/"I Can..." Statement	Resources	Assessments

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ESS3– The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time.

SIZE AND SCALE		
S:ESS3:11:1.1 Recognize electromagnetic waves can be used to locate objects in the universe, and track their movement.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:11:1.2 Define a light year.		
Student Friendly/"I Can..." Statement	Resources	Assessments
STARS AND GALAXIES		
S:ESS3:11:2.1 Identify and describe the characteristics common to most stars in the universe.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:11:2.2 Describe the ongoing processes involved in star formation, their life cycles and their destruction.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:11:2.3 Explain the relationships between or among the energy produced from nuclear reactions, the origin of elements, and the life cycles of stars.		
Student Friendly/"I Can..." Statement	Resources	Assessments
UNIVERSE		
S:ESS3:11:3.1 Explain that current scientific evidence supports the Big Bang Theory as a probable explanation of the origin of the universe, and describe the theory.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:ESS3:11:3.2 Explain the evidence that suggests the universe is expanding.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:11:3.3 Provide scientific evidence that supports or refutes the "Big Bang" theory of how the universe was formed.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:11:3.4 Based on the nature of electromagnetic waves, explain the movement and location of objects in the universe or their composition (e.g., red shift, blue shift, line spectra).		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS3:11:3.5 Explain how scientific theories about the structure of the universe have been advanced through the use of sophisticated technology (e.g., space probes and visual, radio and x-ray telescopes).		
Student Friendly/"I Can..." Statement	Resources	Assessments

ESS4– The growth of scientific knowledge in Earth Space Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:ESS4:11:1.1 Describe ways in which technology has increased our understanding of the universe.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:11:1.2 Understand that technology is designed with a particular function in mind; and principles of Earth Space science are useful in creating technology for the Earth space sciences.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:ESS4:11:2.1 Describe the use and benefits of land-based light telescopes, radio telescopes, spectrophotometers, satellites, manned exploration, probes, and robots to the study of Earth Space Science.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:11:2.2 Explain how scientists study the Earth using computer-generated models and observations from both land-based sites and satellites; and describe the value of using these tools in unison.		
Student Friendly/"I Can..." Statement	Resources	Assessments
LOCAL AND GLOBAL ENVIRONMENTAL ISSUES		
S:ESS4:11:3.1 Differentiate between and provide examples of renewable and nonrenewable sources of energy; and explain the advantages and limitations of each.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:11:3.2 Describe the means for transforming a natural material, such as iron ore, into useful products during different historical periods,		

such as the Stone Age, Iron Age, Renaissance, the Industrial Period and the current Age of Information.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:ESS4:11.3.3 Explain how the use of technologies at a local level, such as burning of fossil fuels for transportation or power generation, may contribute to global environmental problems.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:ESS4:11:4.1 Explain the kinds of applications of knowledge and skills necessary for jobs/careers specific to Earth or space sciences.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Life Science

LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

CLASSIFICATION		
S:LS1:11:1.1 Describe how organisms are classified into a hierarchy of groups and subgroups, which are based on similarities that reflect their evolutionary relationships.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe how organisms are classified Identify the hierarchy of groups and subgroups for living things Summarize the ways that similarities among groups reflects their evolutionary relationships 	Resources	Assessments
S:LS1:11:1.2 Explain that organisms that possess similar DNA code are more closely related than those in which DNA varies greatly.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define DNA Investigate the DNA code for a variety of organisms Compare the DNA for similar organisms Compare the DNA for very different organisms Generalize the connection between DNA and similarities or differences in organisms. 	Resources	Assessments
S:LS1:11:1.3 Identify plants and animals according to binomial nomenclature.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define binomial nomenclature Determine the genus and species names for an organism Identify plants and animals using binomial nomenclature 	Resources	Assessments
S:LS1:11:1.4 Differentiate between prokaryotic and eukaryotic cells according to general structure and degrees of complexity.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ul style="list-style-type: none"> Describe the structure and complexity of a prokaryotic cell Describe the structure and complexity of a eukaryotic cell Contrast prokaryotic and eukaryotic cells 		
LIVING THINGS AND ORGANIZATION		
S:LS1:11:2.1 Identify the structures of different types of cell parts/organelles and explain the functions they perform.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define organelle Identify each part of the cell or organelle Describe the structure of each part of the cell or organelle Explain the functions of each cell part or organelle 	Resources	Assessments
S:LS1:11:2.2 Recognize how cell functions are regulated through changes in the activity of the functions performed by proteins, and through the selective expression of individual genes; and explain how this regulation allows cells to respond to their environment and to control and coordinate cell growth and division.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:11:2.3 Recognize how an organism's organization and complexity accommodate its need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy used to sustain it.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:11:2.4 Explain how the processes of photosynthesis and cellular respiration are interrelated and contribute to biogeochemical cycles.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe the reactants and products of the photosynthesis cycle Describe process of cellular respiration Explain how the reactants and products of photosynthesis cycle 	Resources	Assessments

through the environment		
S:LS1:11:2.5 Describe the structures of proteins and their role in cell function.		
Student Friendly/"I Can..." Statement •	Resources	Assessments
S:LS1:11:2.6 Describe the chemical reactions involved in cell functions using examples from the nervous, immune and endocrine systems in multicellular animals.		
Student Friendly/"I Can..." Statement • Describe the chemical reactions that take place in the nervous system • Describe the chemical reactions that take place in the immune system • Describe the chemical reactions that take place in the endocrine system	Resources	Assessments
S:LS1:11:2.7 Recognize that because all matter tends toward more disorganized states, living systems need a continuous input of energy to maintain their chemical and physical organizations.		
Student Friendly/"I Can..." Statement • Summarize ways that matter tends to become more disorganized • Predict the results when living systems do not continually receive energy • Explain how living systems need energy to maintain their organization	Resources	Assessments
S:LS1:11:2.8 Use data and observation to make connections between, to explain, or to justify how specific cell organelles produce/regulate what the cell needs or what a unicellular or multi-cellular organism needs for survival (e.g., protein synthesis, DNA transport, nerve cells).		
Student Friendly/"I Can..." Statement • Describe the various cell organelles and explain their functions • Justify how different cell organelles produce or regulate what is needed for survival • Investigate ways that the survival needs of the cells are connected to survival needs of the organism	Resources	Assessments
REPRODUCTION		

S:LS1:11:3.1 Describe the chemical and structural properties of DNA and explain its role in identifying the characteristics of an organism.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:11:3.2 Recognize that new heritable characteristics can only result from new combinations of existing genes or from mutations of genes in an organism's sex cells; and explain why other changes in an organism cannot be passed on.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:11:3.3 Describe the alternation of generations, life cycles with haploid and diploid phases in living organisms, such as bacteria, plants and animals.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS1:11:3.4 Explain or justify with evidence how the alteration of the DNA sequence may produce new gene combinations that make little difference, enhance capabilities, or can be harmful to the organism (e.g., selective breeding, genetic engineering, mutations).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain how altering the DNA sequence produces new gene combinations • Show how selective breeding, genetic engineering, and mutations create new gene combinations • Support or give proof of how changes in DNA can affect organisms 	Resources	Assessments

LS2– Energy flows and matter recycles through an ecosystem.

ENVIRONMENT

S:LS2:11:1.1 Explain how the amount of life an environment can sustain is restricted by the availability of matter and energy, and the ability of the ecosystem to recycle materials.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:LS2:11:1.2 Describe how the interrelationships and interdependencies among organisms generate stable ecosystems that fluctuate around a state of rough equilibrium for hundreds or thousands of years.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:LS2:11:1.3 Identify the factors in an ecosystem that can affect its carrying capacity.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:LS2:11:1.4 Analyze and describe how environmental disturbances, such as climate changes, natural events, human activity and the introduction of invasive species, can affect the flow of energy or matter in an ecosystem.

Student Friendly/"I Can..." Statement	Resources	Assessments
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S:LS2:11:1.5 Using data from a specific ecosystem, explain relationships or make predictions about how environmental disturbance (human impact or natural events) affects the flow of energy or cycling of matter in an ecosystem.

Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain the flow of energy or cycling of matter within an ecosystem • Summarize ways that human impact or natural events have affected ecosystems in the past • Using data from specific ecosystem, predict ways that human impact or natural disaster will affect the 	Resources	Assessments
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ecosystem		
S:LS2:11:1.6 Explain or evaluate potential bias in how evidence is interpreted in reports concerning a particular environmental factor that impacts the biology of humans.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define potential bias • Collect evidence from reports on environmental issues from several sources • Evaluate the evidence to determine potential bias • Explain how potential bias affects the ways evidence is interpreted when an environmental factor impacts humans 	Resources	Assessments
FLOW OF ENERGY AND RECYCLING OF MATERIALS		
S:LS2:11:2.1 Use examples from local ecosystems to describe the relationships among organisms at the different trophic levels.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define the various trophic levels of the food chain • Describe how organisms at different trophic levels work together • Use examples from local ecosystems to describe how organisms at different trophic levels work together 	Resources	Assessments
RECYCLING OF MATERIALS		
S:LS2:11:3.1 Explain that as matter and energy flow through different levels of organization in living systems and between living systems and the environment, elements, such as carbon and nitrogen, are recombined in different ways.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe how the processes of LD reactions feed into the dark (calvin) cycle reactions • Explain the importance of chemistry and the intermediates of the calvin cycle • Summarize how the processes of cellular respiration and photosynthesis are reverse processes 	Resources	Assessments

<ul style="list-style-type: none"> • Explain how matter and energy are rearranged as they flow through living systems and the environment 		
<p>S:LS2:11:3.2 Trace the cycling of matter (e.g., carbon cycle) and the flow of energy in a living system from its source through its transformation in cellular, biochemical processes (e.g., photosynthesis, cellular respiration, fermentation).</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Explain how the reactants and products of photosynthesis cycle through the environment • Explain how matter moves through a system • Follow the path of energy through a living organism 	<p>Resources</p>	<p>Assessments</p>

LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry).

CHANGE		
S:LS3:11:1.1 Identify ways humans can impact and alter the stability of ecosystems, such as habitat destruction, pollution, and consumption of resources; and describe the potentially irreversible effects these changes can cause.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:1.2 Identify ways of detecting, and limiting or reversing environmental damage.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:1.3 Analyze the aspects of environmental protection, such as ecosystem protection, habitat management, species conservation and environmental agencies and regulations; and evaluate and justify the need for public policy in guiding the use and management of the environment.		
Student Friendly/"I Can..." Statement	Resources	Assessments
EVIDENCE OF EVOLUTION		
S:LS3:11:2.1 Explain the currently accepted theory for the development of life on Earth, including the history of its origin and the evolutionary process.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:2.2 Recognize that the abilities and behaviors an organism has, and likelihood of its survival strongly depend on its heritable characteristics, which can be biochemical and anatomical.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:2.3 Explain the contributions of Darwin, Malthus, Wallace and Russell to the advancement of life science.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:LS3:11:2.4 Explain evolution in terms of how the Earth's present-day life forms evolved from earlier, distinctly different species as a consequence of the interactions of (1) the potential for a species to increase its numbers, (2) the genetic variability of offspring due to mutation and recombination of genes, (3) a finite supply of the resources required for life, and (4) the ensuing selection.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:2.5 Explain how evidence from technological advances supports or refutes the genetic relationships among groups of organisms (e.g., DNA analysis, protein analysis).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define refutes • Explain the genetic relationship among organisms • Describe technological advances in life sciences • Evaluate evidence from technological advances to support or refute the genetic relationships among organisms 	Resources	Assessments
S:LS3:11:2.6 Given information about living or extinct organisms, cite evidence to explain the frequency of inherited characteristics of organisms in a population; or explain the evolution of varied structures (with defined functions) that affected the organisms' survival in a specific environment (e.g., giraffe, wind pollination of flowers).		
Student Friendly/"I Can..." Statement	Resources	Assessments
NATURAL SELECTION		
S:LS3:11:3.1 Explain the concept of natural selection.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:3.2 Explain the diversity and unity of past and present life forms on Earth using currently accepted theories.		

Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:3.3 Recognize how a species' chance of survival increases with each variation of an organism within the species; and explain how, in the event of a major global change, the greater the diversity of species on Earth, the greater the chance for survival of life.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:3.4 Analyze present day data and research in areas, including antibiotic resistance in bacteria, changes in viral genomes, such as bird flu, and DNA sequencing; and relate it to the concepts of natural selection.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:3.5 Identify and describe ways genes may be changed and combined to create genetic variation within a species.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:3.6 Explain that gene mutations and new combinations may have a variety of effects on the organism, including positive and negative ones, or none at all.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:3.7 Explain the concepts of Mendelian genetics.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS3:11:3.8 Use pedigree charts and Punnet Squares to determine patterns of inheritance.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:LS3:11:3.9 Given a scenario, provide evidence that demonstrates how sexual reproduction results in a great variety of possible gene combinations and contributes to natural selection (e.g., Darwin's finches, isolation of a species, Tay Sach's disease).		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define natural selection • Give examples of various traits that result from gene combinations, including some with negative effects • Using a scenario, give reasons that show how sexual reproduction creates a great variety of gene combinations • Explain how the variety that comes from sexual reproduction also contributes to natural selection 	Resources	Assessments

LS4– Humans are similar to other species in many ways, and yet are unique among Earth’s life forms.

BEHAVIOR		
S:LS4:11:1.1 Recognize that the immune system, endocrine system, and nervous system can affect the homeostasis of an organism.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:11:1.2 Describe how the functions of all the human body systems are interrelated at a chemical level and how they maintain homeostasis.		
Student Friendly/"I Can..." Statement	Resources	Assessments
DISEASE		
S:LS4:11:2.1 Explain that disease in organisms can be caused by intrinsic failures of the system or infection by other organisms, and describe as well as provide examples of how some diseases are caused by: the breakdown in cellular function, congenital conditions, genetic disorders, malnutrition, and emotional health, including stress.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:11:2.2 Explain that vaccines were developed to reduce or eliminate diseases; and provide examples of how these medical advances have proven to be successful.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:11:2.3 Describe and provide examples of how new medical techniques, efficient health care delivery systems, improved sanitation, and a more complete understanding of the nature of disease provides today’s humans a better chance of staying healthier than their forebears.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:11:2.4 Describe how some drugs mimic or block the molecules involved in transmitting nerve or hormone signals and explain how this disturbs the normal operations of the brain and body.		
Student Friendly/"I Can..." Statement	Resources	Assessments
<ul style="list-style-type: none"> Describe how molecules are involved 		

<p>the relay of nerve or hormone signals in the body</p> <ul style="list-style-type: none"> • Explain how some drugs can mimic or block the molecules needed to relay nerve or hormone signals • Summarize ways that blocking the signals from nerves or hormones can disturb the way the body works 		
<p>S:LS4:11:2.5 Explain that gene mutation in a cell can result in uncontrolled division, which is called cancer; and describe how exposure of cells to certain chemicals and radiation increase mutation, and thus the chance for cancer.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define gene mutations • Define cancer • Define cell division • Explain that gene mutations can cause cell division to get out of control • Describe ways that chemicals or radiation can cause mutations to increase • Draw conclusions about how exposure to chemicals and radiation is related to the chance of developing cancer 	<p>Resources</p>	<p>Assessments</p>
<p>S:LS4:11:2.6 Use evidence to make and support conclusions about the ways that humans or other organisms are affected by environmental factors or heredity (e.g., pathogens, diseases, medical advances, pollution, mutations).</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define heredity • Describe things in the environment that can affect a human or other organism • Investigate and summarize ways that organisms are affected by their environment • Describe factors in an organism's heredity that can affect the organism 	<p>Resources</p>	<p>Assessments</p>
<p>HUMAN IDENTITY</p>		

S:LS4:11:3.1 Describe how the length and quality of human life are influenced by many factors, including sanitation, diet, medical care, gender, genes, and environmental conditions and personal health behaviors.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:11:3.2 Explain how the immune system functions to prevent and fight disease.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS4:11:3.3 Explain how the immune system, endocrine system, or nervous system works and draw conclusions about how systems interact to maintain homeostasis in the human body.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define homeostasis • Identify the parts of the immune system, endocrine system, and nervous system • Explain the functions of the immune system, endocrine system, and nervous system • Explain how the immune, endocrine and nervous systems work together to maintain homeostasis 	Resources	Assessments

LS5– The growth of scientific knowledge in Life Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:LS5:11:1.1 Describe ways in which technology has increased our understanding of the life sciences.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:11:1.2 Understand that technology is designed with a particular function in mind, and principles of life science are useful in creating technology for the life sciences.		
Student Friendly/"I Can..." Statement	Resources	Assessments
TOOLS		
S:LS5:11:2.1 Describe the use and benefits of equipment such as light microscopes, transmission electron microscopes, scanning electron microscopes, spectrophotometers, probes, and robotics to the study of the life sciences.		
Student Friendly/"I Can..." Statement	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
MEDICAL TECHNOLOGY		
BIOTECHNOLOGY		
S:LS5:11:3.1 Describe ways technology can support and improve our understanding of environmental issues.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:11:3.2 Describe aspects of the medical system available to help people in New Hampshire, including: prevention programs, vaccines and pharmaceuticals, hospitals and rehabilitation facilities.		
Student Friendly/"I Can..." Statement	Resources	Assessments

S:LS5:11:3.3 Recognize that biotechnology is used in many areas, such as agriculture, pharmaceuticals, the environment, and genetic engineering; and understand that it requires extensive knowledge of the systems being changed.		
Student Friendly/"I Can..." Statement	Resources	Assessments
S:LS5:11:3.4 Explain how advances in agriculture made using biotechnology have directly affected the food production over the past 100 years; and that this change has profoundly affected societies all over the globe, making larger populations and urban centers a possibility.		
Student Friendly/"I Can..." Statement	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:LS5:11:4.1 Explain the kinds of applications of knowledge and skills necessary for jobs/careers specific to the life sciences.		
Student Friendly/"I Can..." Statement	Resources	Assessments

Physical Science

PS1– All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size/amount of substance).

COMPOSITION		
S:PS1:11:1.1 Recognize and describe the structure of an atom and explain how the major components interact with one another.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe the parts of an atom Identify the parts of an atom Explain how protons, neutrons, and electrons interact in an atom 	Resources	Assessments
S:PS1:11:1.2 Recognize how elements are arranged in the periodic table; and explain how this arrangement illustrates the repeating patterns among elements with similar properties, such as the relationship between atomic number and atomic mass.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe how elements are arranged on the periodic table Explain how the arrangement of elements shows the repeating pattern of properties 	Resources	Assessments
S:PS1:11:1.3 Explain that neutrons and protons are made up of even smaller constituents.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Explain how protons are made up of smaller particles Explain how neutrons are made up of smaller particles 	Resources	Assessments
S:PS1:11:1.4 Define isotopes; recognize that most elements have two or more isotopes; and explain that although the number of neutrons has little affect on how the atom interacts with others, they do affect the mass and stability of the nucleus.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define isotopes Explain that most atoms have two or more isotopes Explain how the number of neutrons does not affect reactivity Explain how the number of neutrons affects mass and stability of atoms 	Resources	Assessments

S:PS1:11:1.5 Scientific thought about atoms has changed over time. Using information (narratives or models of atoms) provided, cite evidence that changed our understanding of the atom and the development of atomic theory.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Summarize the changes in the theories of atomic structure over time Write a narrative or produce models to demonstrate the developments in atomic theory over time 	Resources	Assessments
S:PS1:11:1.6 Model and explain the structure of an atom or explain how an atom's electron configuration, particularly the outermost electron(s), determines how that atom can interact with other atoms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Model the structure of the atom Explain how the arrangement of electrons in an atom affects how it interacts with other atoms Explain the importance of valence electrons to an atom's behavior Determine the arrangement of electrons of a pair of atoms, and use this to predict how the two atoms will interact with each other 	Resources	Assessments
PROPERTIES		
S:PS1:11:2.1 Explain that the physical properties of a compound are determined by its molecular structure and the interactions among the molecules.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Explain how physical properties are determined by molecular structure Explain how physical properties are determined by interactions among molecules 	Resources	Assessments
S:PS1:11:2.2 Determine whether an atom is either electrically neutral or an ion by referring to its number of electrons.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define an electrically neutral atom Define an ion Identify the number of protons and electrons in an atom 	Resources	Assessments

<ul style="list-style-type: none"> Compare the number of protons with the number of electrons to determine the overall charge on an atom 		
S:PS1:11:2.3 Explain how the chemical properties of an element are governed by the electron configuration of atoms, and describe how atoms interact with one another by transferring or sharing the outermost electrons.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Determine the electron configuration of an atom Use the electron configuration to explain the chemical properties of the atom Summarize the types of bond interactions that form between atoms based on the arrangement of outermost electrons 	Resources	Assessments
S:PS1:11:2.4 Explain that radioactive materials are unstable and undergo spontaneous nuclear reactions, which emit particles and/or wavelike radiation.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define radioactive materials Generalize what it means for radioactive materials to be unstable Summarize the results of a spontaneous nuclear reaction 	Resources	Assessments
S:PS1:11:2.5 Explain that states of matter rely on the arrangement and motion of molecules; and differentiate between the structures of solids, liquids, and gases.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> List the three states of matter Summarize the arrangement and motion of molecules for each of the three states of matter Explain the differences between the structures of solids, liquids, and gases 	Resources	Assessments
S:PS1:11:2.6 Use physical and chemical properties as determined through an investigation to identify a substance.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe the physical properties of a substance observed through a 	Resources	Assessments

<p>scientific study</p> <ul style="list-style-type: none"> • Describe the chemical properties of a substance observed through a scientific study • 		
<p>S:PS1:11:2.7 Explain how properties of elements and the location of elements on the periodic table are related.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Demonstrate where the metallic elements are located on the periodic table • Demonstrate where the nonmetallic elements on the periodic table are located • Demonstrate where to find the most active and least active elements on the periodic table • Explain the connection between an element's properties and its location on the periodic table. 	<p>Resources</p>	<p>Assessments</p>

PS2– Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.

CHANGE		
S:PS2:11:1.1 Recognize and explain that atoms may be bonded together into molecules or formula units (crystalline solids).		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain that atoms can bond with one another • Explain the difference between a molecule and a formula unit 	Resources	Assessments
S:PS2:11:1.2 Recognize that atoms interact with one another by transferring or sharing electrons that are furthest from the nucleus; and explain that the outer electrons govern the chemical properties of an element.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain that the outer electrons control the chemical properties of an element • Demonstrate that atoms can interact with one another by transferring electrons • Demonstrate that atoms can interact with one another by transferring electrons 	Resources	Assessments
S:PS2:11:1.3 Explain that compounds are formed through both ionic and covalent bonding.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Define a compound • Define ionic bonding • Define covalent bonding • Explain the process of forming compounds through ionic bonding • Explain the process of forming compounds through covalent bonding 	Resources	Assessments
S:PS2:11:1.4 Recognize that the rates of chemical reactions can vary greatly; and identify the factors that influence these reaction rates, such as how often the reacting atoms and molecules encounter one another, the temperature, and the properties of the reacting species, including shape.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Recognize that rates of chemical reactions are not all the same • List factors that affect the rate of 	Resources	Assessments

<p>chemical reactions</p> <ul style="list-style-type: none"> Describe how the rate is affected by factors such as interaction of atoms and molecules, temperature, and shape of molecules 		
S:PS2:11:1.5 Explain relationships between and among electric charges, magnetic fields, electromagnetic forces, and atomic particles.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Describe the various types of electric charges, magnetic and electromagnetic fields, and electromagnetic forces that affect atomic particles Explain how the various electric and magnetic fields and forces affect atomic particles 	Resources	Assessments
CONSERVATION		
S:PS2:11:2.1 Explain that chemical reactions either release or consume energy.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Explain how a chemical reaction would release energy Give examples of chemical reactions that release energy Explain how a chemical reaction would absorb energy Give examples of chemical reactions that would absorb energy 	Resources	Assessments
S:PS2:11:2.2 Explain that chemical reactions can be accelerated by catalysts, such as enzymes.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Define a catalyst and give an example Explain the effect that a catalyst would have on a chemical reaction 	Resources	Assessments
S:PS2:11:2.3 Recognize that a large number of important reactions involve the transfer of either electrons or hydrogen ions between reacting ions, molecules, or atoms.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Explain the effect that transferring electrons or hydrogen ions has in a 	Resources	Assessments

<p>chemical reaction</p> <ul style="list-style-type: none"> Describe several important reactions that involve the transfer of either electron or hydrogen ions between the particles in the reaction 		
<p>S:PS2:11:2.4 Identify the variety of structures that may be formed from the bonding of carbon atoms, and describe their roles in various chemical reactions, including those required for life processes.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Identify the various types of molecules that can be formed from carbon atoms Describe what carbon-based molecules do in chemical reactions Describe what carbon-based molecules do in the chemical reactions that are important to life 	<p>Resources</p>	<p>Assessments</p>
<p>S:PS2:11:2.5 Demonstrate how transformations of energy produce some energy in the form of heat and therefore the efficiency of the system is reduced (chemical, biological, and physical systems).</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Demonstrate how the efficiency of a system is reduced by heat loss 	<p>Resources</p>	<p>Assessments</p>
<p>ENERGY</p>		
<p>S:PS2:11:3.1 Explain that all energy can be considered to be either kinetic energy, potential energy, or energy contained by a field.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Define kinetic energy Define potential energy Define several types of energies contained by fields Given examples of energy, identify whether they are kinetic, potential, or energy contained by a field Explain that all energy can be considered to be either kinetic, potential, or energy contained by a field 	<p>Resources</p>	<p>Assessments</p>

S:PS2:11:3.2 Provide examples of how kinetic and potential energy can be transformed from one to the other.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Explain how energy is conserved when kinetic and potential energy are transformed from one to another • List several examples of how kinetic and potential energy can be transformed from one to another 	Resources	Assessments
S:PS2:11:3.3 Describe how the energy associated with individual atoms and molecules can be used to identify the substances they comprise; and explain that each kind of atom or molecule can gain or lose energy only in particular discrete amounts, absorbing and emitting light only at wavelengths corresponding to these amounts.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Explain how to use various types of energy, e.g. ionization energy, electron affinity, to identify atoms or molecules • Investigate the amount of energy gained or lost by atoms or molecules when changes occur in their atomic structure, e.g. flame tests • Explain the connections between the amount of energy gained or lost and the structure of the electrons in an atom 	Resources	Assessments
S:PS2:11:3.4 Explain the range of the electromagnetic spectrum as it relates to both wavelength and energy; and provide examples of practical applications of the different wavelengths in the spectrum.		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define wavelength • Describe the electromagnetic spectrum • Explain how the wavelength and energy are related on the electromagnetic spectrum • Give examples of real-world applications for different wavelengths on the spectrum 	Resources	Assessments
S:PS2:11:3.5 Recognize that the human eye can only see a narrow range of wavelengths within the electromagnetic spectrum; and explain how		

the variations of wavelength within that range of visible light are perceived as differences in color.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe the portion of the electromagnetic spectrum that is visible to the human eye Explain the connections between wavelength and the colors of the visible spectrum 	Resources	Assessments
S:PS2:11:3.6 Describe the relationship between heat and temperature, explaining that heat energy consists of the random motion and vibrations of atoms, molecules, and ions; and that the higher the temperature, the greater the atomic or molecular motion.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe heat energy as motion of particles Explain the connection between temperature and heat energy Use kinetic theory to explain that as temperature increases, heat increases, and so motion of the molecules increases 	Resources	Assessments
S:PS2:11:3.7 Explain that waves, such as light, seismic, sound waves, have energy and can transfer energy when they interact with matter.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe different types of waves such as light, seismic, and sound Explain how the energy of waves is transferred when they move through matter 	Resources	Assessments
S:PS2:11:3.8 Explain that nuclear reactions convert a fraction of the mass of interacting particles into energy and release much greater amounts of energy than atomic interactions.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Explain the energy changes that happen in nuclear reactions Compare the energy released in nuclear reactions with the energy released in atomic interactions 	Resources	Assessments
S:PS2:11:3.9 Describe how electrons flow easily in some materials, such as metals, whereas in insulating materials, such as glass, they can hardly flow at all.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ul style="list-style-type: none"> • Define conductivity • Explain the differences between insulators and conductors • Give examples of insulators • Give examples of conductors 		
<p>S:PS2:11:3.10 Using information provided about chemical changes, draw conclusions about the energy flow in a given chemical reaction (e.g., exothermic reactions, endothermic reactions).</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Define exothermic reactions • Define endothermic reactions • Predict the energy change in a chemical reaction 	<p>Resources</p>	<p>Assessments</p>

PS3– The motion of an object is affected by force.

FORCES		
S:PS3:11:1.1 Explain that magnetic forces are related to the action of electrons and can be thought of as different aspects of a single electromagnetic force; and describe how the interplay of these forces is the basis for electric motors, generators, radio, television, and many other modern technologies.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain the connections between magnetic forces and the actions of electrons • Describe how magnetism and electricity made a way for technology, e.g. motors, generators, radio, tv. 	Resources	Assessments
S:PS3:11:1.2 Recognize that the strength of the electric force between two charged objects is proportional to the charges and, as with gravitation, is inversely proportional to the square of the distance between them.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Investigate the relationship between electric force and charges on objects • Investigate the relationship between the strength of electric force and the distance between two objects • Summarize the relationship between the strength of electric forces and the charges on objects • Summarize the relationship between the strength of electric forces and the distance between the objects 	Resources	Assessments
S:PS3:11:1.3 Recognize that the strength of the gravitational force between two masses is proportional to the masses and inversely proportional to the square of the distance between them.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the relationship between gravity and the masses of the objects • Describe the relationship between gravity and the distance between the objects 	Resources	Assessments
S:PS3:11:1.4 Compare the strength of nuclear, electromagnetic and gravitational forces; and explain that the strength of nuclear forces account for the great amounts of energy released from the nuclear reactions in atomic or hydrogen bombs, and in the Sun and other stars.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ul style="list-style-type: none"> • Describe nuclear forces • Describe electromagnetic forces • Describe gravitational forces • Compare the strength of nuclear, electromagnetic and gravitational forces • Explain that the large amounts of energy in the Sun, stars, or atomic bombs is due to nuclear forces 		
S:PS3:11:1.5 Recognize that electromagnetic forces exist within and between atoms.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Describe the particles that make up an atom • Describe the electromagnetic forces that are found in atoms • Describe the electromagnetic forces that exist between atoms 	Resources	Assessments
S:PS3:11:1.6 Recognize that different kinds of materials respond to electric forces in various ways; and differentiate between insulators, semiconductors, conductors and superconductors.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Explain the ways that materials are affected by electric forces • Describe insulators • Describe semiconductors • Describe conductors • Describe superconductors • Summarize the differences between insulators, semiconductors, conductors, and superconductors 	Resources	Assessments
S:PS3:11:1.7 Describe the difference between materials that contain equal proportions of positive and negative charges and those that have a very small excess or deficit of negative charges.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> • Predict the results when atoms or materials have equal amounts of positive and negative charges • Predict the results when atoms or 	Resources	Assessments

<p>materials have unequal amounts of positive and negative charges</p> <ul style="list-style-type: none"> • Explain the difference between neutral materials and those with charges 		
<p>S:PS3:11:1.8 Given information (e.g., graphs, data, diagrams), use the relationships between or among force, mass, velocity, momentum, and acceleration to predict and explain the motion of objects.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Explain the relationships between force, mass, and acceleration • Explain the relationships between mass, velocity and momentum • Interpret information from graphs, data, or diagrams about the motion of objects • Explain the motion of objects • Predict the motion of objects 	Resources	Assessments
<p>MOTION</p>		
<p>S:PS3:11:2.1 Interpret and apply the laws of motion to determine the effects of forces on the motion of objects.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Describe Newton's laws of motion • Give examples of how the law of inertia effects the motion of objects • Give examples of how the motion of objects is changed using $F=ma$ • Give examples of ways that equal and opposite forces affect the motion of objects 	Resources	Assessments
<p>S:PS3:11:2.2 Recognize that apparent changes in wavelength can provide information about changes in motion; explain that the observed wavelength of a wave depends upon the relative motion of the source and the observer; and relate these to the differences between shorter and longer wavelengths.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> • Explain the connection between wavelength and sound energy or light energy • Investigate the results when the source of sound or light energy goes 	Resources	Assessments

<p>into motion</p> <ul style="list-style-type: none"> Investigate the results of moving the source of energy with shorter or longer wavelengths Explain how the motion of the source or the observer affects how I perceive sound or light 		
<p>S:PS3:11:2.3 Apply the concepts of inertia, motion, and momentum to predict and explain situations involving forces and motion, including stationary objects and collisions.</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Define inertia Define momentum Explain the effects of inertia and momentum on an object in motion Explain what happens to stationary objects when force is applied Explain changes in force during a collision Predict what will happen to objects in motion when forces are applied Predict changes in force during a collision 	<p>Resources</p>	<p>Assessments</p>
<p>S:PS3:11:2.4 Explain the effects on wavelength and frequency as electromagnetic waves interact with matter (e.g., light diffraction, blue sky).</p>		
<p>Student Friendly/"I Can..." Statement</p> <ul style="list-style-type: none"> Give real-world examples of wavelength changes Give real-world examples of frequency changes Explain how wavelength changes when electromagnetic waves interact with matter Explain how frequency changes when electromagnetic waves interact with matter 	<p>Resources</p>	<p>Assessments</p>

PS4– The growth of scientific knowledge in Physical Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

DESIGN TECHNOLOGY		
S:PS4:11:1.1 Recognize that the basic principles of energy, work and power are related to design technology.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Investigate ways that energy, work, and power principles have been used in inventions in the past Describe how various types of technology use principles of energy, work, and power 	Resources	Assessments
TOOLS		
S:PS4:11:2.1 Identify tools, such as thermostats and thermal sensors, and explain their use in environmental control systems.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Give examples of various environmental control systems from my daily life Describe the use of tools like thermostats and thermal sensors Explain what tools are needed to operate an environmental control system 	Resources	Assessments
SOCIAL ISSUES (LOCAL AND GLOBAL)		
ENERGY, POWER, AND TRANSPORTATION		
MANUFACTURING		
S:PS4:11:3.1 Explain that power systems have a source of energy, a process, loads, and some have a feedback system.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Give examples of various power systems from my world Describe the parts of a power system 	Resources	Assessments
S:PS4:11:3.2 Demonstrate and explain how an engine converts chemical energy in the form of fuel, into mechanical energy in the form of motion.		
Student Friendly/"I Can..." Statement	Resources	Assessments

<ul style="list-style-type: none"> Describe the type of chemical energy needed to operate an engine Describe the type of mechanical energy produced by an engine Demonstrate the process that an engine uses to convert chemical energy to mechanical energy 		
S:PS4:11:3.3 Calculate the efficiency of an engine, and explain why a perfectly efficient engine is impossible.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define efficiency of an engine Calculate the efficiency of an engine Explain the loss of energy that occurs in an engine Describe a perfectly efficient engine Explain why it is impossible to have a perfectly efficient engine 	Resources	Assessments
S:PS4:11:3.4 Explain the relationship between energy and power.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Define energy Define power Investigate the relationship between energy and power Explain how energy and power are related 	Resources	Assessments
S:PS4:11:3.5 Explain the benefits of standardization of parts.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Describe what it means to have standardized parts to machines Give real world examples of the benefits of standardizing parts 	Resources	Assessments
CAREER TECHNICAL EDUCATION CONNECTIONS		
S:PS4:11:4.1 Explain the kinds of applications of knowledge and skills necessary for jobs/careers specific to the physical sciences.		
Student Friendly/"I Can..." Statement <ul style="list-style-type: none"> Explore several careers that need physical science knowledge Describe some of the knowledge and 	Resources	Assessments

skills that I would need to do a job in physical science		
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