

Maryland State Curriculum, Science, 2008	ESS Presentations
KINDERGARTEN	
STANDARD 1.0: SKILLS AND PROCESSES	
Topic A: Constructing knowledge	
Indicator 1: Raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things out	
a. Describe what can be learned about things by just observing those things carefully and adding information by sometimes doing something to the things and noting what happens.	Materials Matter Feel the Force Light and Dark Hot and Cold Growing Up Shadows Weather
b. Seek information through reading, observation, exploration, and investigations.	Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants
c. Use tools such as thermometers, magnifiers, rulers, or balances to extend their senses and gather data.	Springs Growing Plants Weather
d. Explain that when a science investigation is done the way it was done before, we expect to get a very similar result.	
e. Participate in multiple experiences to verify that science investigations generally work the same way in different places.	
f. Suggest things that you could do to find answers to questions raised by observing objects and/or phenomena (events such as, water disappearing from the classroom aquarium or a pet's water bowl).	Hot and Cold Materials Matter Magnets Shadows Growing Plants Living Things

K-2 Product

3-5 Product

g. Use whole numbers and simple, everyday fractions in ordering, counting, identifying, measuring, and describing things and experiences.	Springs Growing Plants
Topic B: Applying evidence and reasoning	
Indicator 1: People are more likely to believe your ideas if you can give good reasons for them.	
a. Provide reasons for accepting or rejecting ideas examined.	Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants
b. Develop reasonable explanations for observations made, investigations completed, and information gained by sharing ideas and listening to others' ideas.	Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants
c. Explain why it is important to make some fresh observations when people give different descriptions of the same thing	
Topic C: Communicating scientific information	
Indicator 1: Ask, "How do you know?" in appropriate situations and attempt reasonable answers when others ask them the same question.	

	<p>Marvellous Materials Animals and Plants Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants</p>
a. Describe things as accurately as possible and compare observations with those of others.	
b. Describe and compare things in terms of number, shape, texture, size, weight, color, and motion.	<p>Marvellous Materials Feel the Force</p>
c. Draw pictures that correctly portray at least some features of the thing being described and sequence events (seasons, seed growth).	<p>Light and Dark Changing Materials Senses Living Things</p>
d. Have opportunities to work with a team, share findings with others, and recognize that all team members should reach their own conclusions about what the findings mean.	
e. Recognize that everybody can do science and invent things and ideas.	
Topic D: Technology	
Indicator 1: Design and make things with simple tools and a variety of materials.	
a. Make something out of paper, cardboard, wood, plastic, metal, or existing objects that can actually be used to perform a task.	
b. Recognize that tools are used to do things better or more easily and to do some things that could not otherwise be done at all.	
c. Assemble, describe, take apart and reassemble constructions using interlocking blocks, erector sets and the like.	
d. Recognize that some kinds of materials are better than others for making any particular thing, for example, materials that are better in some ways (such as stronger and cheaper) may be worse in other ways (such as heavier and harder to cut).	<p>Materials Matter</p>
e. Explain that sometimes it is not possible to make or do everything that is designed.	
Indicator 2: Practice identifying the parts of things and how one part connects to and affects another.	
a. Investigate a variety of objects to identify that most things are made of parts	
b. Explain that something may not work if some of its parts are missing.	

c. Explain that when parts are put together, they can do things that they couldn't do by themselves.	
Indicator 3: Examine a variety of physical models and describe what they teach about the real things they are meant to resemble.	
a. Explain that a model of something is different from the real thing but can be used to learn something about the real thing.	
b. Realize that one way to describe something is to say how it is like something else.	
STANDARD 2.0: EARTH/SPACE SCIENCE	
Topic A: Materials and Processes That Shape A Planet	
Indicator 1: Investigate objects and materials in the environment.	
a. Observe and describe a variety of natural and human-made objects found in familiar environments (school, neighborhood, etc.).	Marvellous Materials Materials Matter Rocks Changing Materials
b. Examine and describe Earth materials: Rocks; soil; water	Rocks Soil
c. Using examples, describe that objects and materials, such as trees, rocks, and hills on Earth's surface can change.	Changing Materials
Topic D: Astronomy	
Indicator 1: Observe celestial objects that are visible in the day and night sky.	
a. Identify and describe the sun, moon and stars.	Weather
b. Describe ways in which the daytime and nighttime skies are different.	Weather
Topic E: Interactions of Hydrosphere and Atmosphere	
Indicator 2: Investigate and gather information about changes in weather.	
a. Observe and describe different weather conditions using senses.	Weather
b. Record observations using pictures, pictographs, or written/oral language.	Weather
c. Describe qualitative changes in weather, such as temperatures, precipitation, wind, etc	Weather
STANDARD 3.0: LIFE SCIENCE	
Topic A: Diversity of Life	
Indicator 1: Observe a variety of familiar animals and plants (perhaps on the school grounds, in the neighborhood, and at home) to discover patterns of similarity and difference among them.	
a. Identify and describe features (observable parts) of animals and plants that make some of them alike in the way they look and the things they do.	Animals and Plants

b. Compare descriptions of the features that make some animals and some plants very different from one another.	Animals and Plants
c. Identify a feature that distinguishes animals that fly (as an example) from animals that cannot and examine a variety of animals that can fly to discover other similar features they might share.	
d. Compare ideas about how the features of animals and plants affect what these animals are able to do.	
Indicator 2: Gather information and direct evidence that humans have different external features, such as size, shape, etc., but that they are more like one another than like other animals.	
a. Organize data collected and draw conclusions about similarities and differences among humans.	
b. Explain ways in which humans are more like one another than like other animals.	Animals and Plants
c. Describe similarities in what both humans and other animals are able to do because they possess certain external features.	Animals and Plants
Topic C: Genetics	
Indicator 1: Observe, describe and compare the life cycles of different kinds of animals and plants.	
a. Identify and draw pictures that show what an animal (egg to frog) and a plant (seed to tree) looks like at each stage of its life cycle.	Growing Up
b. Describe and compare the changes that occur in the life cycle of two different animals, such as a frog and a puppy and two different plants, such as a rosebush and a maple tree.	Growing Up
c. Identify and describe the changes that occur in humans as they develop: Size; weight; appearance	
Topic D: Evolution	
Indicator 1: Recognize that living things are found almost everywhere in the world and that there are somewhat different kinds of living things in different places.	
a. Observe, describe, and give examples and describe the many kinds of living things found in different places in Maryland.	Living Things
b. Using pictures, films and illustrated texts identify, describe and compare living things found in other states such as Texas and Alaska to those found in Maryland.	
c. Explain that the external features of plants and animals affect how well they thrive in different kinds of places.	
Topic E: Flow of Matter and Energy	

Indicator 1: Develop an awareness of the relationship of features of living things and their ability to satisfy basic needs that support their growth and survival.	
a. Make observations of the features and behaviors of many different kinds of animals within an environment to identify and begin building a list of some of the basic needs these organisms share, such as water, air, etc.	Living Things
b. Describe ways that people and other animals manage to bring the things they need from their environment into their bodies.	
c. Make observations of the features of many different kinds of plants within an environment to identify and begin building a list of some of the basic needs these organisms share, such as water, light, etc.	Animals and Plants Living Things
d. Describe the way that most plants manage to bring water from the environment into the plant.	Growing Plants
Topic F: Ecology	
Indicator 1: Investigate a variety of familiar places where plants and animals live to describe the place and the living things found there.	
a. Describe observations using drawings, oral or written text of the place and some of the living things found there.	Living Things
b. Based on the observations collected at each place compare the plants and animals found there: Location; activity; movement; features.	Living Things
c. Describe ways that animals and plants found in each place interact with each other and with their environment.	
STANDARD 4.0: CHEMISTRY	
Topic A: Structure of Matter	
Indicator 1: Compare the observable properties of a variety of objects and the materials they are made of using evidence from investigations.	
a. Examine and describe various objects in terms of the materials, such as clay, cloth, paper, etc. from which they are made.	Marvellous Materials
b. Based on data, describe the observable properties, such as size, shape, color, and texture of a variety of objects.	Materials Matter Marvellous Materials
c. Identify and compare the properties of materials objects are made of and the properties of the objects.	Materials Matter Marvellous Materials
STANDARD 5.0: PHYSICS	
Topic A: Mechanics	
Indicator 1: Compare the different ways objects move.	
a. Given many different objects, make them move and describe and compare how they move: Straight; round and round; back and forth; zig-zag	Feel the Force

Indicator 2: Explain that there must be a cause for changes in the motion of an object	
a. Observe and describe the ways in which a variety of objects' motion can be changed: Sped up from a standstill; slow down to a stop; go faster; go slower; no change; change direction	Feel the Force
b. Based on observations, identify what caused the changes in an object's motion: Push; pull	Feel the Force
Topic B: Thermodynamics	
Indicator 1: Describe that sunlight warms the land, air, and water using observations and age appropriate tools.	
a. Recognize and describe temperature changes of the land, air, and water before and after the sun warms them using senses and thermometers.	
Topic C: Electricity and Magnetism	
Indicator 3: Observe and gather information from the explorations to describe how magnets affect some objects.	
a. Observe and describe what happens when magnets are placed on or near objects made of different materials.	Mysterious Magnets
b. Raise and seek answers to questions about what happened to the objects investigated and/or to the magnet.	Mysterious Magnets
Topic D: Wave Interactions	
Indicator 2: Observe and describe that sound is produced by vibrating objects.	
a. Observe and relate the vibrations of objects that make sounds (drums, guitar strings, and tuning forks) to the sounds felt and heard.	Sounds
b. Based on information from observations identify the source of vibrations in familiar objects that produce sounds.	Senses Sounds
STANDARD 6.0: ENVIRONMENTAL SCIENCE	
Topic B: Environmental Issues	
Indicator 1: Identify aspects of the environment that are made by humans and those that are not made by humans.	
a. Identify features of the natural environment, such as parks, zoos, buildings, etc. that are made by humans.	
b. Identify features of the natural environment that are not made by humans.	
GRADE 1	
STANDARD 1.0: SKILLS AND PROCESSES	
Topic A: Constructing knowledge	

Indicator 1: Raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things out	
a. Describe what can be learned about things by just observing those things carefully and adding information by sometimes doing something to the things and noting what happens.	Materials Matter Feel the Force Light and Dark Hot and Cold Growing Up Shadows Weather
b. Seek information through reading, observation, exploration, and investigations.	Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants
c. Use tools such as thermometers, magnifiers, rulers, or balances to extend their senses and gather data.	Springs Growing Plants Weather
d. Explain that when a science investigation is done the way it was done before, we expect to get a very similar result.	
e. Participate in multiple experiences to verify that science investigations generally work the same way in different places.	
f. Suggest things that you could do to find answers to questions raised by observing objects and/or phenomena (events such as, water disappearing from the classroom aquarium or a pet's water bowl).	Hot and Cold Materials Matter Magnets Shadows Growing Plants Living Things
g. Use whole numbers and simple, everyday fractions in ordering, counting, identifying, measuring, and describing things and experiences.	Springs Growing Plants
Topic B: Applying evidence and reasoning	
Indicator 1: People are more likely to believe your ideas if you can give good reasons for them.	

<p>a. Provide reasons for accepting or rejecting ideas examined.</p>	<p>Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants</p>
<p>b. Develop reasonable explanations for observations made, investigations completed, and information gained by sharing ideas and listening to others' ideas.</p>	<p>Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants</p>
<p>c. Explain why it is important to make some fresh observations when people give different descriptions of the same thing</p>	
<p>Topic C: Communicating scientific information</p>	
<p>Indicator 1: Ask, "How do you know?" in appropriate situations and attempt reasonable answers when others ask them the same question.</p>	
<p>a. Describe things as accurately as possible and compare observations with those of others.</p>	<p>Marvellous Materials Animals and Plants Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants</p>
<p>b. Describe and compare things in terms of number, shape, texture, size, weight, color, and motion.</p>	<p>Marvellous Materials Feel the Force</p>

c. Draw pictures that correctly portray at least some features of the thing being described and sequence events (seasons, seed growth).	Light and Dark Senses Changing Materials Living Things
d. Have opportunities to work with a team, share findings with others, and recognize that all team members should reach their own conclusions about what the findings mean.	
e. Recognize that everybody can do science and invent things and ideas.	
Topic D: Technology	
Indicator 1: Design and make things with simple tools and a variety of materials.	
a. Make something out of paper, cardboard, wood, plastic, metal, or existing objects that can actually be used to perform a task.	
b. Recognize that tools are used to do things better or more easily and to do some things that could not otherwise be done at all.	
c. Assemble, describe, take apart and reassemble constructions using interlocking blocks, erector sets and the like.	
d. Recognize that some kinds of materials are better than others for making any particular thing, for example, materials that are better in some ways (such as stronger and cheaper) may be worse in other ways (such as heavier and harder to cut).	Materials Matter
e. Explain that sometimes it is not possible to make or do everything that is designed.	
Indicator 2: Practice identifying the parts of things and how one part connects to and affects another.	
a. Investigate a variety of objects to identify that most things are made of parts	
b. Explain that something may not work if some of its parts are missing.	
c. Explain that when parts are put together, they can do things that they couldn't do by themselves.	
Indicator 3: Examine a variety of physical models and describe what they teach about the real things they are meant to resemble.	
a. Explain that a model of something is different from the real thing but can be used to learn something about the real thing.	
b. Realize that one way to describe something is to say how it is like something else.	
STANDARD 2.0: EARTH/SPACE SCIENCE	
Topic D: Astronomy	
Indicator 2: Recognize that there is a relationship between the sun and the earth.	
a. Identify ways that the sun affects the earth including that the sun warms the earth and provides light.	Weather Light and Dark Shadows

Topic E: Interactions of Hydrosphere and Atmosphere	
Indicator 1: Describe observable changes in water on the surface of the Earth.	
a. Cite examples of the sun's effect on what happens to water on the Earth's surface: Water disappears from puddles, wet surfaces after rain, any open container, etc.; Water can be a liquid or a solid and go back and forth from one form to another	Hot and Cold Water Cycle
Indicator 2: Describe that some events in nature have repeating patterns.	
a. Observe and compare day-to-day weather changes.	Weather
b. Observe, record, and compare weather changes from month to month.	Weather
c. Compare temperatures and type and amount of precipitation across the months.	Weather
d. Identify the impact of weather changes on daily activities.	Weather
e. Identify and describe patterns of weather conditions based on data collected.	
STANDARD 3.0: LIFE SCIENCE	
Topic A: Diversity of Life	
Indicator 1: Compare and explain how external features of plants and animals help them survive in different environments.	
a. Use the senses and magnifying instruments to examine a variety of plants and animals to describe external features and what they do.	Animals and Plants Growing Plants
b. Compare similar features in some animals and plants and explain how each of these enables the organism to satisfy basic needs.	Animals and Plants
c. Use the information collected to ask and compare answers to questions about how an organism's external features contribute to its ability to survive in an environment.	
d. Classify organisms according to one selected feature, such as body covering, and identify other similarities shared by organisms within each group formed.	Animals and Plants
Topic B: Cells	
Indicator 1: Describe evidence from investigations that living things are made of parts too small to be seen with the unaided eye.	
a. Use magnifying instruments to observe parts of a variety of living things, such as leaves, seeds, insects, worms, etc. to describe (drawing or text) parts seen with the magnifier.	
b. Use information gathered from observations to compare the descriptions (drawings or text) of the different parts seen.	
c. Describe some of the ideas or questions that might result from examining organisms more closely.	

Indicator 2: Provide evidence that all organisms are made of parts that help them carry out the basic functions of life.	
a. Gather information and direct evidence that humans and other animals have different body parts used to seek, find, and take in food.	Adaptations
b. Investigate and identify parts of the body that alert humans and other animals to danger and help them to fight, hide or get out of danger.	Senses
c. Describe some parts of plants and describe what they do for the plant.	Growing Plants
d. Respond, giving reasons to support the response, to the statement "All living things are made of parts."	
Topic C: Genetics	
Indicator 1: Explain that there are differences among individuals in any population.	
a. Examine a variety of populations of plants and animals (including humans), to identify ways that individual members of that population are different from one another.	Adaptations
b. Make a list of possible advantages and disadvantages of differences of individuals in a population of organisms.	Adaptations
Indicator 2: Recognize that all living things have offspring, usually with two parents involved.	
a. Examine a variety of living things and their offspring and describe what each parent and offspring looks like.	Growing Up
b. Identify similarities and differences among the offspring and between the offspring and each parent.	Growing Up
c. Based on observations, construct an appropriate response to the question "Are parents and offspring more similar than they are different?"	Growing Up
Topic E: Flow of Matter and Energy	
Indicator 1: Describe some of the ways in which animals depend on plants and on each other.	
a. Examine organisms in a wide variety of environments to gather information on how animals satisfy their need for food. Some animals eat only plants; some animals eat only other animals; Some animals eat both plants and other animals.	Interdependence
STANDARD 5.0: PHYSICS	
Topic C: Electricity and Magnetism	
Indicator 3: Describe the effect magnets have on a variety of objects.	
a. Classify materials based on their behavior in the presence of a magnet.	Mysterious Magnets
b. Describe how the magnet affects the behavior of objects within each group.	Mysterious Magnets Magnets
STANDARD 6.0: ENVIRONMENTAL SCIENCE	

Topic B: Environmental Issues	
Indicator 1: Recognize that caring about the environment is an important human activity.	
a. Recognize and describe that individual and group actions, such as recycling, help the environment.	Pollution
b. Recognize and describe that individual and group actions, such as littering, harm the environment.	Habitats Pollution
c. Give reasons why people should take care of their environments.	Living Things Habitats Pollution
GRADE 2	
STANDARD 1.0: SKILLS AND PROCESSES	
Topic A: Constructing knowledge	
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b. Seek information through reading, observation, exploration, and investigations.	Materials Matter Living Things Mysterious Magnets Hot and Cold Springs Soil Rocks Magnets Growing Plants
c. Use tools such as thermometers, magnifiers, rulers, or balances to extend their senses and gather data.	Springs Growing Plants Weather
d. Explain that when a science investigation is done the way it was done before, we expect to get a very similar result.	

e. Participate in multiple experiences to verify that science investigations generally work the same way in different places.	
f. Suggest things that you could do to find answers to questions raised by observing objects and/or phenomena (events such as, water disappearing from the classroom aquarium or a pet's water bowl).	Hot and Cold Materials Matter Magnets Shadows Growing Plants Living Things
g. Use whole numbers and simple, everyday fractions in ordering, counting, identifying, measuring, and describing things and experiences.	Springs Growing Plants
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b. Describe and compare things in terms of number, shape, texture, size, weight, color, and motion.	<p>Marvellous Materials Feel the Force</p>
c. Draw pictures that correctly portray at least some features of the thing being described and sequence events (seasons, seed growth).	<p>Changing Materials Living Things Senses Light and Dark</p>
d. Have opportunities to work with a team, share findings with others, and recognize that all team members should reach their own conclusions about what the findings mean.	
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STANDARD 2.0: EARTH/SPACE SCIENCE	
Topic A: Materials and processes that shape a planet	
Indicator 1: Describe and compare properties of a variety of Earth materials.	
a. Classify a collection of rocks based on the properties that distinguish one type from another.	Rocks
b. Collect soil from different locations and compare the properties of the samples: Color; texture; reaction to water; remains of living things	Soil
c. Use examples of observations from places around the school and neighborhood to describe ways Earth materials can change: Changes caused by humans and other animals; changes caused by water, wind, etc.	Erosion, Transportation and Deposition Pollution Habitats
Topic D: Astronomy	
Indicator 1: Observe and describe changes over time in the properties, location, and motion of celestial objects.	
a. Identify and record observable properties of the sun, moon, and stars.	Shadows Weather The Moon
b. Identify and record the apparent visible changes in the shape of the moon over two months of observations.	The Moon
c. Observe and record changes in the location of the sun and moon in the sky over time.	Shadows
d. Describe and compare the patterns of change that occur in the sun and the moon.	Shadows The Moon
Topic E: Interactions of Hydrosphere and Atmosphere	
Indicator 1: Recognize and describe that the surface of Earth is more than half covered with water.	
a. Identify the many locations where water is found.	Water Cycle
b. Describe the changes that occur to water found anywhere.	Water Cycle
STANDARD 3.0: LIFE SCIENCE	
Topic C: Genetics	

Indicator 1: Explain that there are identifiable stages in the life cycles (growth, reproduction, and death) of plants and animals.	
a. Investigate and describe that seeds change and grow into plants.	Growing Up
b. Compare and describe the changes that occur in humans during their life cycle (birth, newborn, child, adolescent, adult, elder).	
c. Given pictures of stages in the life cycle of a plant or an animal, determine the sequence of the stages in the life cycle.	Growing Up
d. Provide examples, using observations and information from readings that life cycles differ from species to species.	Growing Up
Topic D: Evolution	
Indicator 1: Observe and describe examples of variation (differences) among individuals of one kind within a population.	
a. Observe and describe individuals in familiar animal populations, such as cats or dogs, to identify how they look alike and how they are different.	Adaptations
b. Examine pictures of organisms that lived long ago, such as dinosaurs, and describe how they resemble organisms that are alive today.	Fossils
c. Recognize that some kinds of organisms have completely disappeared.	Fossils
Topic F: Ecology	
Indicator 1: Explain that organisms can grow and survive in many very different habitats.	Living Things Habitats
a. Investigate a variety of familiar and unfamiliar habitats and describe how animals and plants found there maintain their lives and survive to reproduce.	Living Things Habitats
b. Explain that organisms live in habitats that provide their basic needs: Food; water; air; shelter	Living Things Habitats
c. Explain that animals and plants sometimes cause changes in their environments.	
STANDARD 4.0: CHEMISTRY	
Topic A: Structure of Matter	
Indicator 1: Cite evidence from investigations that most things are made of parts.	
a. Examine a variety of objects, such as toys, objects made from Legos or Tinker Toys to identify and describe the parts from which they are made.	
b. Take objects apart and rearrange the parts to identify and describe the ways the parts work together.	
c. Ask and seek answers to "What if" questions about the changes made to the objects and how they affect the way objects work, for example, if a part were left out of the object would it make a difference in how the object works?	
Topic B: Conservation of Matter	

Indicator 1: Provide evidence from investigations that things can be done to materials to change some of their properties.	
a. Based on evidence from investigations describe that materials, such as clay are not changed by certain actions, such as reshaping or breaking into pieces.	Changing Materials
b. Ask and seek answers to questions about what happened to the materials if other things were done to them, such as being placed in a freezer, heated, etc.	Changing Materials
Topic D: Physical and Chemical Changes	
Provide evidence from investigations to identify processes that can be used to change physical properties of materials.	
a. Based on investigations, describe what changes occur to the observable properties of various materials when they are subjected to the processes of wetting, cutting, bending, and mixing.	Changing Materials
b. Compare the observable properties of objects before and after they have been subjected to various processes.	Changing Materials
c. Ask and seek answers to "What if" questions about what might happen to the materials if different processes, such as heating, freezing, and dissolving were used to change them.	Changing Materials
STANDARD 5.0: PHYSICS	
Topic B: Thermodynamics	
Indicator 1: Identify and describe ways in which heat can be produced.	
a. Recognize that things that give off light also give off heat.	
b. Describe methods of producing heat: Burning, friction between surfaces, electricity in wires	
c. Identify fuels that are used to produce light and heat in homes and schools.	
Topic C: Electricity and Magnetism	
Indicator 1: Identify and describe the sources and uses of electricity in daily life.	
a. Identify sources of electricity. Electrical outlets, batteries	Energy Forms Circuits
b. Identify the devices that use electricity to produce light, heat, and sound. (Students should be cautioned not to experiment with sources of electricity without adult supervision.)	Energy Forms
STANDARD 6.0: ENVIRONMENTAL SCIENCE	
Topic A: Natural Resources and Human Needs	

Indicator 1: Recognize and explain how Earth's natural resources from the natural environment are used to meet human needs.	
a. Describe natural resources as something from the natural environment that is used to meet one's needs.	Pollution
b. Identify water, air, soil, minerals, animals, and plants as basic natural resources.	
c. Explain that food, fuels, and fibers are produced from basic natural resources.	Changing Materials Growing Plants
d. Identify ways that humans use Earth's natural resources to meet their needs.	Growing Plants Pollution
e. Explain that some natural resources are limited and need to be used wisely.	Pollution
Topic B: Environmental Issues	
Indicator 1: Recognize and describe that the activities of individuals or groups of individuals can affect the environment.	
a. Identify and describe that individual and group actions, such as turning off lights, conserving water, recycling, picking up litter, or joining an organization can extend the natural resources of the environment.	Pollution
b. Identify and describe that individual and group actions, such as leaving lights on, wasting water, or throwing away recyclables, can limit the natural resources of the environment.	Pollution
GRADE 3	
STANDARD 1.0: SKILLS AND PROCESSES	
Topic A: Constructing knowledge	
Indicator 1: Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.	
a. Support investigative findings with data found in books, articles, and databases, and identify the sources used and expect others to do the same.	
b. Select and use appropriate tools hand lens or microscope (magnifiers), centimeter ruler (length), spring scale (weight), balance (mass), Celsius thermometer (temperature), graduated cylinder (liquid volume), and stopwatch (elapsed time) to augment observations of objects, events, and processes.	Soil Microorganisms Gravity Changing State Plant Reproduction
c. Explain that comparisons of data might not be fair because some conditions are not kept the same.	Soil
d. Recognize that the results of scientific investigations are seldom exactly the same, and when the differences are large, it is important to try to figure out why.	

<p>e. Follow directions carefully and keep accurate records of one's work in order to compare data gathered.</p>	<p>Separating Mixtures Friction Forces Pollution Insulators and Conductors Plant Reproduction</p>
<p>f. Identify possible reasons for differences in results from investigations including unexpected differences in the methods used or in the circumstances in which the investigation is carried out, and sometimes just because of uncertainties in observations.</p>	
<p>g. Judge whether measurements and computations of quantities are reasonable in a familiar context by comparing them to typical values when measured to the nearest: millimeter - length; square centimeter - area; milliliter - volume; newton - weight; gram - mass; second - time; degree C - temperature</p>	
<p>Topic B: Applying Evidence and Reasoning</p>	
<p>Indicator 1: Seek better reasons for believing something than "Everybody knows that..." or "I just know" and discount such reasons when given by others.</p>	
<p>a. Develop explanations using knowledge possessed and evidence from observations, reliable print resources, and investigations.</p>	<p>Days and Seasons Sounds Insulators and Conductors Changing State Friction Separating Mixtures Circuits Plant Reproduction Forces Reflection and Refraction Predicting the Weather Electromagnets</p>

	Days and Seasons Sounds Insulators and Conductors Changing State Friction Separating Mixtures Circuits Plant Reproduction Forces Reflection and Refraction Predicting the Weather Electromagnets
b. Offer reasons for their findings and consider reasons suggested by others.	
c. Review different explanations for the same set of observations and make more observations to resolve the differences.	
d. Keep a notebook that describes observations made, carefully distinguishes actual observations from ideas and speculations about what was observed, and is understandable weeks or months later.	
Topic C: Communicating Scientific Information	
Indicator 1: Recognize that clear communication is an essential part of doing science because it enables scientists to inform others about their work, expose their ideas to criticism by other scientists, and stay informed about scientific discoveries around the world.	
a. Make use of and analyze models, such as tables and graphs to summarize and interpret data.	Forces Friction Pollution
b. Avoid choosing and reporting only the data that show what is expected by the person doing the choosing.	
c. Submit work to the critique of others which involves discussing findings, posing questions, and challenging statements to clarify ideas.	
d. Construct and share reasonable explanations for questions asked.	Friction Forces Separating Mixtures Plant Reproduction Reflection and Refraction Insulators and Conductors

e. Recognize that doing science involves many different kinds of work and engages men and women of all ages and backgrounds.	
Topic D: Technology	
Indicator 1: DESIGN CONSTRAINTS: Develop designs and analyze the products: "Does it work?" "Could I make it work better?" "Could I have used better materials?"	
a. Choose appropriate common materials for making simple mechanical constructions and repairing things.	
b. Realize that there is no perfect design and that usually some features have to be sacrificed to get others, for example, designs that are best in one respect (safety or ease of use) may be inferior in other ways (cost or appearance).	
c. Identify factors that must be considered in any technological design-cost, safety, environmental impact, and what will happen if the solution fails.	
Indicator 1: DESIGNED SYSTEMS: Investigate a variety of mechanical systems and analyze the relationship among the parts.	
a. Realize that in something that consists of many parts, the parts usually influence one another.	
b. Explain that something may not work as well (or at all) if a part of it is missing, broken, worn out, mismatched, or misconnected.	
Indicator 1: MAKING MODELS: Examine and modify models and discuss their limitations.	
a. Explain that a model is a simplified imitation of something and that a model's value lies in suggesting how the thing modeled works.	
b. Investigate and describe that seeing how a model works after changes are made to it may suggest how the real thing would work if the same were done to it.	
c. Explain that models, such as geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories can be used to represent objects, events, and processes in the real world, although such representations can never be exact in every detail.	
d. Realize that one way to make sense of something is to think how it is like something more familiar.	
STANDARD 2.0: EARTH/SPACE SCIENCE	
Topic C: Plate tectonics	
Indicator 1: Gather information and provide evidence about the physical environment, becoming familiar with the details of geological features, observing and mapping locations of hills, valleys, rivers, and canyons.	

a. Identify and describe some natural features of continents; Mountains, valleys, rivers, canyons	Erosion, Transportation and Deposition
b. Describe the natural features in their immediate outdoor environment, and compare the features with those of another region in Maryland.	
c. Identify and describe some features of the ocean floor: Mountains, valleys, canyons	
d. Recognize and explain that an ocean floor is land covered by water.	
Topic E: Interactions of Hydrosphere and Atmosphere	
Indicator 1: Recognize and describe that water can be found as a liquid or a solid on the Earth's surface and as a gas in the Earth's atmosphere.	
a. Describe that air is a substance that surrounds us and contains such things as oxygen, water vapor (gas), pollen, dust, etc.	
b. Observe and explain what happens when liquid water disappears: Turns into water vapor (gas) in the air; can reappear as a liquid or solid when cooled, such as clouds, fog, rain, snow, etc.	Changing State Water Cycle Predicting the Weather
STANDARD 3.0: LIFE SCIENCE	
Topic B: Cells	
Indicator 1: Explore the world of minute living things to describe what they look like, how they live, and how they interact with their environment.	
a. Use magnifying instruments to observe and describe using drawings or text (oral or written) minute organisms, such as brine shrimp, algae, aphids, etc. that are found in different environments.	Microorganisms
b. Describe any observable activity displayed by these organisms.	Microorganisms
c. Provide reasons that support the conclusion that these organisms are alive.	Microorganisms
d. Use information gathered about these minute organisms to compare mechanisms they have to satisfy their basic needs to those used by larger organisms.	
Topic E: Flow of Matter and Energy	
Indicator 1: Recognize that materials continue to exist even though they change from one form to another.	
a. Identify and compile a list of materials that can be recycled.	Pollution
b. Identify what happens to materials when they are recycled.	Pollution
c. Observe and record the sequence of changes that occur to plants and animals that die and decay.	
d. Ask and develop possible answers to questions about what happens to the materials that living things are made of when they die.	
STANDARD 4.0: CHEMISTRY	

Topic A: Structure of Matter	
Indicator 1: Identify ways to classify objects using supporting evidence from investigations of observable properties.	
a. Classify objects based on their observable properties.	Marvellous Materials
b. Provide reasons for placing the objects into groups.	Marvellous Materials
c. Compare classifications with those of others.	Marvellous Materials
Indicator 2: Identify and describe structures of objects too small to be seen clearly with the unaided eye.	
a. Identify and describe minute objects, such as grains of sand and crystals of salt after examining them with a magnifying instrument.	
b. Identify and describe the minute features of objects, such as the lines (grain) in a piece of wood and the fibers in a paper napkin after examining with a magnifying instrument.	Friction
Topic C: States of Matter	
Indicator 1: Provide evidence from investigations to describe the effect that changes in temperature have on the properties of materials.	
a. Based on data gathered from investigations, identify and describe the changes that occur to the observable properties of materials when different degrees of heat is applied to them, such as melting chocolate pieces, boiling an egg.	Separating Mixtures Changing State
b. Observe and describe the changes cooling causes to the observable properties of materials when they are cooled, such as freezing water in a straw, milk in an ice cream maker.	Changing State
c. Cite examples of similar changes that heating and cooling have on the observable properties of various other materials.	Separating Mixtures
STANDARD 5.0: PHYSICS	
Topic A: Mechanics	
Indicator 1: Cite evidence from observations to describe the motion of an object using position and speed.	
a. Describe the position of an object by locating it relative to another object or to its background.	
b. Using information from multiple trials, compare the speeds (faster or slower) of objects that travel the same distance in different amounts of time.	
c. Using information from multiple trials, compare the distances that objects moving at different speeds travel in the same amount of time.	
Indicator 2: Explain that changes in the ways objects move are caused by forces.	

a. Observe and describe the way an object's motion changes in a variety of situations (rolling a ball, bouncing a ball, dropping a yo-yo, winding up a toy, etc.) and identify what may have caused the change.	
b. Describe changes in the motion of objects as they move across different textured surfaces and suggest possible causes for the change.	Friction
c. Observe and describe that objects fall to the ground unless something holds them up (gravity).	Forces Gravity
Topic B: Thermodynamics	
Indicator 1: Recognize and describe that heat is transferred between objects that are at different temperatures.	
a. Recognize and describe that the temperature of an object increases when heat is added and decreases when heat is removed.	Separating Mixtures Changing State
b. Recognize and describe that heat will flow between object at different temperatures until they reach the same temperature.	
Topic D: Wave Interactions	
Indicator 2: Identify and describe the relationship between a sound and the vibrations that produce it.	
a: Based on observations of objects that produce sound, relate vibration to the back and forth motion of parts of the object.	Sounds
b. Pose questions concerning the relationship between loudness or pitch and the vibration of an object.	Sounds
GRADE 4	
STANDARD 1.0: SKILLS AND PROCESSES	
Topic A: Constructing knowledge	
Indicator 1: Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.	
a. Support investigative findings with data found in books, articles, and databases, and identify the sources used and expect others to do the same.	
b. Select and use appropriate tools hand lens or microscope (magnifiers), centimeter ruler (length), spring scale (weight), balance (mass), Celsius thermometer (temperature), graduated cylinder (liquid volume), and stopwatch (elapsed time) to augment observations of objects, events, and processes.	Soil Microorganisms Gravity Changing State Plant Reproduction

c. Explain that comparisons of data might not be fair because some conditions are not kept the same.	Soil
d. Recognize that the results of scientific investigations are seldom exactly the same, and when the differences are large, it is important to try to figure out why.	
e. Follow directions carefully and keep accurate records of one's work in order to compare data gathered.	Separating Mixtures Friction Forces Pollution Insulators and Conductors Plant Reproduction
f. Identify possible reasons for differences in results from investigations including unexpected differences in the methods used or in the circumstances in which the investigation is carried out, and sometimes just because of uncertainties in observations.	
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Indicator 1: Seek better reasons for believing something than "Everybody knows that..." or "I just know" and discount such reasons when given by others.	
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	Days and Seasons Sounds Insulators and Conductors Changing State Friction Separating Mixtures Circuits Plant Reproduction Forces Reflection and Refraction Predicting the Weather Electromagnets
b. Offer reasons for their findings and consider reasons suggested by others.	
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d. Realize that one way to make sense of something is to think how it is like something more familiar.	
STANDARD 2.0: EARTH/SPACE SCIENCE	
Topic A: Materials and processes that shape a planet	
Indicator 2: Recognize and explain how physical weathering and erosion cause changes to the earth's surface.	
a. Investigate and describe how weathering wears down Earth's surface. Water; ice; wind	Erosion, Transportation and Deposition

b. Cite evidence to show that erosion shapes and reshapes the earth's surface as it moves from one location to another: Water; ice; wind	Erosion, Transportation and Deposition
Topic B: Earth History	
Indicator 2: Recognize and explain that fossils provide evidence about the plants and animals that lived long ago and about the nature of the environment at that time.	
a. Recognize and explain that the remains or imprints of plants or animals can become fossils.	Fossils
b. Describe the physical structures of an animal or plant based on its fossil remains.	Fossils
c. Identify what an animal or plant fossil is able to tell about the environment in which it lived: Water; land.	Fossils
Topic D: Astronomy	
Indicator 1: Identify and describe the variety of objects in the universe through first-hand observations using the unaided eye, binoculars or telescopes or videos and/or pictures from reliable sources.	
a. Observe and describe the stars and the planets as seen through a telescope, graphically in pictures or in video clips from reliable sources.	Our Solar System
b. Identify the sun as the Earth's closest star.	Our Solar System
c. Recognize that stars are like the sun, some are smaller and some larger.	
d. Recognize and describe that the stars are not all the same in apparent brightness.	
e. Recognize that the pattern of stars in the sky stays the same although their locations in the sky appear to change with the seasons.	Our Solar System
Topic E: Interactions of Hydrosphere and Atmosphere	
Indicator 2: Recognize and describe that each season has different weather conditions	
a. Describe different seasonal weather conditions using data collected from weather instruments, models or drawings.	Weather Days and Seasons
b. Compare average daily temperatures during different seasons.	Weather
c. Compare average daily wind speed and direction during different seasons.	Weather
d. Compare average daily precipitation during different seasons: amount; type.	Weather
STANDARD 3.0: LIFE SCIENCE	
Topic A: Diversity of Life	
Indicator 1: Explain how animals and plants can be grouped according to observable features.	
a. Observe and compile a list of a variety of animals or plants in both familiar and unfamiliar environments.	
b. Classify a variety of animals and plants according to their observable features and provide reasons for placing them into different groups.	Habitats Adaptations

c. Given a list of additional animals or plants, decide whether or not they could be placed within the established groups or does a new group have to be added.	
d. Describe what classifying tells us about the relatedness among the animals or plants placed within any group.	
Topic C: Genetics	
Indicator 1: Explain that in order for offspring to resemble their parents, there must be a reliable way to transfer information from one generation to the next.	
a. Describe traits found in animals and plants, such as eye color, height, leaf shape, seed type that are passed from one generation to another	
b. Explain that some likenesses between parents and offspring are inherited (such as eye color in humans, nest building in birds, or flower color in plants) and other likenesses are learned (such as language in humans)	
c. Raise questions based on observations of a variety of parent and offspring likenesses and differences, such as "Why don't all the puppies have the same traits, such as eye color and size as their parents?" or "How do traits get transferred?"	
d. Develop a reasonable explanation to support the idea that information is passed from parent to offspring.	
Topic D: Evolution	
Indicator 1: Explain that individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.	
a. Describe ways in which organisms in one habitat differ from those in another habitat and consider how these differences help them survive and reproduce.	Habitats Adaptations
b. Explain that the characteristics of an organism affect its ability to survive and reproduce.	Adaptations
c. Examine individuals in a group of the same kind of animals or plants to identify differences in characteristics, such as hearing ability in rabbits or keenness of vision in hawks that might give those individuals an advantage in surviving and reproducing.	Adaptations
d. Examine and compare fossils to one another and to living organisms as evidence that some individuals survive and reproduce.	
Topic E: Flow of Matter and Energy	
Indicator 1: Recognize food as the source of materials that all living things need to grow and survive.	
a. Classify the things that people and animals take into their bodies as food or not food.	
b. Describe what happens to food in plants and animals: Contributes to growth; supports repair; provides energy; is stored for future use; is eliminated	Body Systems

c. Identify the things that are essential for plants to grow and survive.	Growing Plants Plant Reproduction
Topic F: Ecology	
Indicator 1: Explain ways that individuals and groups of organisms interact with each other and their environment.	
a. Identify and describe the interactions of organisms present in a habitat: Competition for space, food, and water; Beneficial interactions: nesting, pollination, seed dispersal, oysters filtering as in the Chesapeake Bay, etc.; Roles within food chains and webs: scavengers, decomposers, producers, consumers.	Interdependence Food Chains Plant Reproduction
b. Explain that changes in an organism's habitat are sometimes beneficial to it and sometimes harmful.	Pollution Habitats Adaptations Interdependence
STANDARD 4.0: CHEMISTRY	
Topic A: Structure of Matter	
Indicator 1: Provide evidence to support the fact that matter has observable and measurable properties	
a. Identify examples of matter.	
b. Describe and compare the physical properties of samples of matter: Strength; hardness; flexibility; ability to conduct heat; ability to conduct electricity; ability to be attracted by magnets	Magnets Electromagnets Insulators and Conductors
c. Compare samples of like materials using appropriate tools to measure, estimate, and calculate size, capacities, masses and weights.	
d. Cite evidence that supports the statement, "All matter takes up space and contains a certain amount of material."	Changing State
STANDARD 5.0: PHYSICS	
Topic B: Thermodynamics	
Indicator 1: Provide evidence that heat can be transferred in different ways.	
a. Recognize and explain that heat can be transferred either by direct contact between objects at different temperatures or without direct contact: A spoon in hot water; Heat from a flame	

b. Observe, describe, and compare materials that readily conduct heat and those that do not conduct heat very well.	Insulators and Conductors
c. Classify materials as conductors or insulators based on how easily heat flows through them.	Insulators and Conductors
Topic C: Electricity and Magnetism	
Indicator 1: Recognize and describe the effects of static electric charges.	
a. Observe and describe how to produce static charges by friction between two surfaces.	
b. Observe the phenomena produced by the static charges: Light; sound; feeling a shock; attracting lightweight materials over a distance without making contact	
Indicator 2: Investigate and provide evidence that electricity requires a closed loop in order to produce measurable effects.	
a. Identify the source of electricity needed to produce various effects: Light - flashlight (battery); Heat - hot plate, hairdryer (outlet, battery); Sound - Ipod (battery) , doorbell (electrical wiring); Movement - mechanical toys (battery, outlet)	Energy Forms Electromagnets
b. Investigate and describe (orally or with diagrams) how to light a light bulb or sound a buzzer given a battery, wires, and light bulb or buzzer.	Circuits Electromagnets
c. Describe and compare the path of electricity (circuit) within this system that caused the light to light or the buzzer to sound to those that do not affect the light or buzzer.	Circuits
d. Observe, describe and compare materials that readily conduct electricity and those that do not conduct electricity.	Insulators and Conductors
e. Provide evidence from observations and investigations that electrical circuits require a complete loop through which electricity can pass.	Circuits
Indicator 3: Cite evidence supporting that forces can act on objects without touching them.	
a. Investigate and describe the effect that two magnets have on each other: Like poles repel; Opposite poles attract	Magnets Electromagnets
b. Based on observations, describe the effect of a magnet on a variety of objects including those that are metallic or non-metallic; those made with iron or made with other metals; and on other magnets.	Magnets
c. Compare a compass to a magnet based on observations of the effect a variety of objects (metallic or non-metallic; those made with iron or other metals; and magnets) have on a compass.	Electromagnets
d. Provide examples to demonstrate the different ways a magnet acts on objects and how the objects respond.	Magnets Electromagnets

e. Investigate and describe how electricity in a wire affects the needle of a compass.	Electromagnets
f. Describe how to make a simple electromagnet with a battery, a nail, and wire.	Electromagnets
g. Cite examples showing that magnetic, electrical, and gravitational forces can act at a distance.	Magnets Gravity Electromagnets
STANDARD 6.0: ENVIRONMENTAL SCIENCE	
Topic B: Environmental Issues	
Indicator 1: Recognize and describe that people in Maryland depend on, change, and are affected by the environment.	
a. Identify and describe that human activities in a community or region are affected by environmental factors: Presence and quality of water; Soil type; Temperature; Precipitation.	
GRADE 5	
STANDARD 1.0: SKILLS AND PROCESSES	
Topic A: Constructing knowledge	
Indicator 1: Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.	
a. Support investigative findings with data found in books, articles, and databases, and identify the sources used and expect others to do the same.	
b. Select and use appropriate tools hand lens or microscope (magnifiers), centimeter ruler (length), spring scale (weight), balance (mass), Celsius thermometer (temperature), graduated cylinder (liquid volume), and stopwatch (elapsed time) to augment observations of objects, events, and processes.	Soil Microorganisms Gravity Changing State Plant Reproduction
c. Explain that comparisons of data might not be fair because some conditions are not kept the same.	Soil
d. Recognize that the results of scientific investigations are seldom exactly the same, and when the differences are large, it is important to try to figure out why.	

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b. Avoid choosing and reporting only the data that show what is expected by the person doing the choosing.	
c. Submit work to the critique of others which involves discussing findings, posing questions, and challenging statements to clarify ideas.	
d. Construct and share reasonable explanations for questions asked.	Friction Forces Separating Mixtures Plant Reproduction Reflection and Refraction Insulators and Conductors

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d. Realize that one way to make sense of something is to think how it is like something more familiar.	
STANDARD 2.0: EARTH/SPACE SCIENCE	
Topic A: Materials and processes that shape a planet	
Indicator 2: Cite and describe the processes that cause rapid or slow changes in Earth's surface.	
a. Identify and describe events such as tornadoes, hurricanes, volcanic eruptions, earthquakes, and flooding which change surface features rapidly.	

b. Recognize that the natural force of gravity causes changes in the Earth's surface features as it pulls things towards Earth, as in mud and rock slides, avalanches, etc.	
c. Cite examples that demonstrate how the natural agents of wind, water, and ice produce slow changes on the Earth's surface such as carving out deep canyons and building up sand dunes.	Erosion, Transportation and Deposition
Indicator 3: Explain how rock is formed from combinations of different minerals and that smaller rocks come from the breakage and weathering of bedrock (solid rock underlying soil components) and larger rocks; soil is made partly from weathered rock, partly from plant remains-and also contains many living organisms.	
a. Observe and classify a collection of minerals based on their physical properties: Color; luster; hardness; streak	
b. Identify and compare the properties of rocks that are composed of a single mineral with those of other rocks made of several minerals using their physical properties.	
c. Describe ways that the following processes contribute to changes always occurring to the Earth's surface: Weathering; erosion; deposition	Erosion, Transportation and Deposition
Topic D: Astronomy	
Indicator 1: Identify and compare properties, location, and movement of celestial objects in our solar system.	
a. Recognize that like all planets and stars, the Earth is spherical in shape.	Our Solar System
b. Identify the properties of the planet Earth that make it possible for the survival of life as we know it: Temperature; location; presence of an atmosphere; presence of water (solid, liquid, and gas)	
c. Compare the properties of at least one other planet in our solar system to those of Earth to determine if it could support life, as we know it.	
d. Identify and describe physical properties of comets, asteroids, and meteors.	
e. Provide evidence that supports the idea that our solar system is sun-centered.	
Indicator 2: Recognize and describe the causes of the repeating patterns of celestial events.	
a. Describe the rotation of the planet Earth on its axis.	Days and Seasons
b. Recognize and describe that the rotation of planet Earth produces observable effects: The day and night cycle; the apparent movement of the sun, moon, planets, and stars	Days and Seasons
c. Describe the revolution of the planet Earth around the sun.	Days and Seasons

d. Recognize and describe that the revolution of the planet Earth produces effects: The observable patterns of stars in the sky stay the same although different stars can be seen in different seasons; length of year	Days and Seasons Our Solar System
e. Verify with models and cite evidence that the moon's apparent shape and position change.	The Moon
Topic E: Interactions of Hydrosphere and Atmosphere	
Indicator 1: Recognize and describe that the amount of water on Earth continues to stay the same even though it may change from one form to another.	
a. Describe how water on Earth changes: condensation; precipitation; evaporation	Water Cycle Changing State
b. Explain that the sun is the main source of energy that causes the changes in the water on Earth.	Water Cycle
c. Describe the relationship between the amount of energy from the sun and the quantity of water that is changed.	
d. Describe the processes that maintain a continuous water cycle.	Water Cycle
STANDARD 3.0: LIFE SCIENCE	
Topic A: Diversity of Life	
Indicator 1: Explain the idea that in any particular environment, some kinds of plants and animals survive well, some less well, and some cannot survive at all.	
a. Identify and describe features and behaviors of some of the plants and animals living in a familiar environment and explain ways that these organisms are well suited to their environment.	Adaptations Habitats
b. Based on information about the features and behaviors of animals and plants from very different environments describe reasons that they might not survive if their environment changed or if they were moved from one environment to another.	Adaptations
c. State reasons why certain animals such as whales, salmon, could not survive in the Chesapeake Bay.	
d. Research the kind of environment needed by the Maryland blue crab, the Black-eyed Susan (Maryland's state flower), or another Maryland native organism.	
e. Explain that the survival of individual organisms and entire populations can be affected by sudden (flood, Tsunami) or slow (global warming, air pollution) changes in the environment.	Adaptations Pollution
Topic B: Cells	
Indicator 1: Provide evidence from observations and investigations to support the idea that some organisms consist of a single cell.	

a. Use microscopes, other magnifying instruments, or video technology to observe, describe, and compare single celled organisms, such as amoeba, euglena, paramecium, etc.	Microorganisms
b. Describe the observable behaviors of single celled organisms	
c. Cite evidence from data gathered that supports the idea that most single celled organisms have needs similar to those of multicellular organisms.	
Indicator 2: Investigate and provide evidence that living things are made mostly of cells that can be seen and studied only through a microscope.	
a. Use microscopes and/or other video technology to investigate and describe that some organisms are composed of a collection of similar cells working together to meet basic needs of a "colony" of cells.	
b. Use microscopes and pictures to investigate, describe with drawings, and compare the cells in a variety of multicellular organisms, such as cells in elodea and onions; muscle cells, nerve cells, skin cells, etc in animals.	
c. Select information gathered from readings that provides evidence that some organisms' cells vary greatly in appearance and perform very different roles in the organism .	
Topic E: Flow of Matter and Energy	
Indicator 1: Recognize that some source of energy is needed for all organisms to grow and survive.	
a. Identify the sun as the primary source of energy for all living organisms: Plants use sunlight to make food; plants and animals use food for energy and growth	Food Chains
b. Cite evidence from observations and research that some insects and various other organisms depend on dead plant and animal material for food.	
c. Provide examples that justify the statement "Most animals' food can be traced back to plants."	Food Chains Interdependence
STANDARD 4.0: CHEMISTRY	
Topic B: Conservation of Matter	
Indicator 1: Cite evidence to support the statement that, "No matter how many parts of an object are assembled, the mass of the whole object made is always the same as the sum of the parts."	
a. Use magnifying instruments to investigate samples of matter, such as a leaf, sugar cube, color photograph, and granite to describe the minute parts from which they are made.	

b. Use evidence from investigations with a variety of materials, such as water to describe how matter can change from one form to another without the loss of any mass.	
c. Describe the relationship between the masses of whole objects to the sum of the mass of their parts using appropriate tools to gather supporting data.	
Topic C: States of Matter	
Indicator 1: Provide evidence from investigations to identify the processes that can be used to change materials from one state of matter to another.	
a. Observe and describe the changes heating and cooling cause to the different states in which water exists: Heating causes: ice (solid) to melt forming liquid water; liquid water to evaporate forming water vapor (gas). Cooling causes: liquid water to freeze forming ice (solid); water vapor (gas) to form liquid water.	Changing State
b. Based on data explain the importance of water's ability to exist in all three states within the temperatures normally found on Earth.	Water Cycle
c. Analyze data from observations to support the idea that when materials change from one state to another the amount of material stays the same.	
Topic D: Physical and Chemical Changes	
Indicator 1: Provide evidence to illustrate that when a new material is made by combining two or more materials, its properties are different from the original materials.	
a. Investigate and describe what happens to the properties of materials when several materials are combined to make a mixture, such as table salt and pepper; various kinds of nuts, chocolate pieces, and coconut; sugar dissolved in milk	Separating Mixtures
b. Based on observations from investigations and video technology, describe what happens to the observable properties of materials when several materials are combined to make a new material, such as baking soda combined with vinegar	Separating Mixtures
c. Share data gathered and construct a reasonable explanation of the results.	Separating Mixtures
STANDARD 5.0: PHYSICS	
Topic A: Mechanics	
Indicator 1: Describe the motion of objects using distance traveled, time, direction, and speed.	
a. Observe, describe, and compare types of motion: Uniform motion as equal distances traveled in equal times, such as escalators, conveyor belts; variable motion as different distances traveled in equal times, such as an accelerating car, falling objects; periodic motion as motion that repeats itself, such as a child on a swing, a person on a pogo stick.	
b. Use measurements to describe the distance traveled as the change in position.	

c. Based on data describe speed as the distance traveled per unit of time.	
Indicator 2: Explain that the changes in the motion of objects are determined by the mass of an object and the amount (size) of the force applied to it.	
a. Observe and give examples that show changes in speed or direction of motion are caused by an interaction of forces acting on an object: Friction; gravity	Friction Forces Gravity
b. Observe and explain the changes in selected motion patterns using the relationship between force and mass.	
Indicator 4: Cite evidence that energy in various forms exists in mechanical systems.	
a. Identify ways of storing energy (potential) in an object: Raising an object above the ground; putting it on the end of a compressed or extended spring or rubber band	
b. Identify that an object has energy (kinetic) related to its motion: The greater the mass, the greater the energy; the greater the speed, the greater the energy	
c. Observe and cite examples showing that stored energy may be converted to energy of motion and vice versa.	
Topic D: Wave Interactions	
Indicator 3: Provide evidence to show that light travels in a straight line until it is reflected or refracted.	
a. Observe and describe the images formed by a plane mirror: Size of the image; Apparent distance of the image from the mirror; Front-to-back reversal in the image.	
b. Based on observations trace the path of a ray of light before and after it is reflected (bounces) off a plane mirror.	Reflection and Refraction
c. Observe and describe that a ray of light changes direction when it crosses the boundary between two materials such as air and water or air to glass.	Reflection and Refraction
Indicator 4: Recognize and describe how light interacts with different materials.	
a. Classify materials as translucent, transparent or opaque.	Shadows
b. Explain that shadows are formed when objects block light	Shadows
c. Observe and describe that prisms separate white light into its component colors.	
d. Pose questions about why objects appear to be different colors.	
STANDARD 6.0: ENVIRONMENTAL SCIENCE	
Topic A: Natural Resources and Human Needs	
Indicator 1: Recognize and explain how renewable and nonrenewable natural resources are used by humans in Maryland to meet basic needs.	
a. Identify and compare Maryland's renewable resources and nonrenewable resources.	

b. Describe how humans use renewable natural resources, such as plants, soil, water, animals.	Growing Plants Pollution
c. Describe how humans use nonrenewable natural resources, such as oil, coal, natural gas, minerals, including metals	
Topic B: Environmental Issues	
Indicator 1: Recognize and explain that decisions influencing the use of natural resources may have benefits, drawbacks, unexpected consequences, and tradeoffs.	
a. Identify and describe personal and community behaviors that waste natural resources and/or cause environmental harm and those behaviors that maintain or improve the environment.	Pollution
b. Identify and describe that individuals and groups assess and manage risk to the environment differently.	
Indicator 2: Recognize and describe that consequences may occur when Earth's natural resources are used.	
a. Explain how human activities may have positive consequences on the natural environment. Recycling centers; native plantings; good farming practice	
b. Explain how human activities may have a negative consequence on the natural environment. Damage or destruction done to habitats; Air, water, and land pollution	Pollution Habitats Interdependence
c. Identify and describe that an environmental issue affects individual people and groups of people differently.	