

Southern York County School District Instructional Plan

Name:	Dates: Rotating Basis
Course/Subject: Science, Grade 3	Unit Plan: Earth Materials
Stage 1 – Desired Results	
<p>PA Standard(s)/Assessment Anchors Addressed: 3.1.4.A, 3.1.4.B, 3.1.4.C, 3.1.4.D, 3.2.4.B, 3.2.4.C, 3.4.4.A, 3.5.4.B, 3.7.4.A, 3.7.4.B</p> <p>Reference: S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.</p> <p>Reference: S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide.</p> <p>Reference: S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.</p> <p>Reference: S4.C.1.1 Describe observable physical properties of matter.</p> <p>Reference: S4.D.1.2 Identify the types and uses of Earth’s resources.</p>	
<p>Understanding(s): <i>Students will understand . . .</i></p> <ol style="list-style-type: none"> 1. Earth materials have properties that can be observed and described with terms such as color, shape, and texture. 2. Rocks are earth materials composed of a mixture of one or more minerals. 3. A mineral is a basic earth material that cannot be physically broken down any further. 4. Some materials, such as salt and alum, dissolve when they are mixed with water, but re-form when the water evaporates. 5. Hardness, a mineral property, is the resistance of a mineral to being scratched. 6. Different minerals have different properties. 7. Crystal residue from evaporation can provide evidence that calcite is an ingredient in a rock. 8. A unique property of calcite is its reaction with cold acid. 	<p>Essential Question(s):</p> <ul style="list-style-type: none"> ▪ How can a fingernail, a penny, and a paper clip help determine hardness? ▪ What materials make up the Earth and how can they be described? ▪ What makes a rock a rock? ▪ To what extent can the minerals that make up rocks be identified and separated? ▪ How can the knowledge of the Earth’s materials and minerals be helpful to man?
<p>Learning Objectives: <i>Students will know . . .</i></p> <ul style="list-style-type: none"> ▪ Rocks have many properties, including shape, size, color, and texture. ▪ Geologists use rock properties to help identify different rocks. ▪ Some dimensions of rocks can be measured and compared. ▪ Rocks are made of minerals; minerals are made of only one ingredient. ▪ Some ingredients can be identified by breaking rocks apart. ▪ Water can be used to separate ingredients; some break into smaller 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ▪ Make mock rocks and record observations, while comparing the properties of mock rocks to those of real rocks. ▪ Separate mock rock materials, using a geologist’s pick and water in a vial. ▪ Evaporate mock rock water solution to determine any future ingredients (salt crystals). ▪ Investigate four unknown minerals through recording the visible properties. ▪ Use paper clips, pennies, and

<p>pieces, and some dissolve.</p> <ul style="list-style-type: none"> ▪ A mineral is a basic earth material that cannot be broken down into smaller pieces. ▪ It is usually necessary to know several properties of a mineral to identify it. ▪ Hardness is a mineral property – the resistance to being scratched. ▪ Minerals can be put in order by hardness. ▪ A harder object always scratches a softer one. ▪ Calcite is one of the most common minerals on earth. ▪ Calcite is the only mineral that bubbles when it comes in contact with cold acid. ▪ More than one test may be needed to provide conclusive evidence. ▪ Evaporation is a technique used to separate liquid from solid parts of a mixture (review). ▪ Crystal patterns can help us identify minerals. ▪ Granite is a rock made up of minerals, including feldspar, hornblende, mica, and quartz. 	<p>fingernails to discover the hardness of unknown minerals.</p> <ul style="list-style-type: none"> ▪ Identify and order four minerals according to their hardness results of a scratch test. ▪ Place calcite in vinegar to observe a bubbling and fizzing effect as a property of the mineral. ▪ Search for evidence of calcite as an ingredient in several rock samples. ▪ Evaporate the calcite mixture to discover a white needlelike crystal and a powdery substance as evidence of calcite as an ingredient. ▪ Sort a set of earth materials to find a rock, minerals, and granite, through a variety of property tests. ▪ Explain why knowledge of the Earth's materials and minerals can be helpful.
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Name:	Dates: Rotating Basis
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Course/Subject: Science, Grade 3	Unit Plan 2: Human Body
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Stage 1 – Desired Results

PA Standard(s)/Assessment Anchors Addressed: 3.1.4.A, 3.1.4.B, 3.1.4.D, 3.2.4.B, 3.2.4.C, 3.3.4.A, 3.3.4.B, 3.3.4.C, 3.3.4.D, 3.7.4.B

Reference: S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.

Reference: S4.A.3.2 Use models to illustrate simple concepts and compare the models to what they represent.

Reference: S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.

Reference: S4.A.3.1 Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle).

Reference: S4.B.1.1 Identify and describe similarities and differences between living things and their life processes.

Reference: S4.B.2.1 Identify and explain how adaptations help organisms to survive.

Reference: S4.B.2.2 Identify that characteristics are inherited and, thus, offspring closely resemble their parents.

Reference: S4.B.3.1 Identify and describe living and nonliving things in the environment and their interaction.

Understanding(s):	Essential Question(s):
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<p>Students will understand . . .</p> <ol style="list-style-type: none"> 1. A human body can move in many ways. Movements are aided and limited by bone and joint structures. 2. Bones have different structure designed to form the three major functions in the human body: support, protection, and locomotion. 3. The human body has an articulated skeleton ready for action. 4. The main function of muscles is to provide movement, coordination and structure for the body. 5. The action of bones, muscles, and central nervous system working together is called coordination. 6. A stimulus is an event that triggers a response. It is often information received through the senses. 7. A response is a reaction to a stimulus. 	<ul style="list-style-type: none"> ▪ How does your body move? ▪ What are the functions of the bones in the skeleton and how do they work together? ▪ In what ways are the skeletons of a rodent and a human similar? ▪ To what extent are all bones important in creating everyday activities? ▪ To what extent are all the joints in the human skeleton the same or different? ▪ How are leg bones from different animals similar? How are they different? ▪ What is the function of muscles and how do they work ▪ Why doesn't it take the same amount of time for hands and feet to respond to a visual stimulus? ▪ To what extent does practice make a difference in response time? ▪ How long does it take to respond to a visual stimulus?
<p>Name:</p>	<p>Dates: Rotating Basis</p>
<p>Course/Subject: Science, Grade 3</p>	<p>Unit Plan 3: Physics of Sound</p>
<p>Stage 1 – Desired Results</p>	
<p>PA Standard(s)/Assessment Anchors Addressed:</p> <p><u>Assessment Anchors:</u></p> <p>S4.A.1.1 Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. Reference: 3.2.4.A, 3.2.4.C, 3.8.4.C</p> <p>S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem. Reference: 3.2.4.C, 3.2.4.D</p> <p>S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide. Reference: 3.7.4.A, 3.7.4.B</p> <p>S4.A.3.2 Use models to illustrate simple concepts and compare the models to what they represent. Reference: 3.1.4.B, 4.3.4.C</p> <p>S4.C.1.1 Describe observable physical properties of matter. Reference: 3.4.4.A, 3.2.4.B</p> <p>S4.C.2.1 Recognize basic energy types and sources, or describe how energy can be changed from one form to another. Reference: 3.4.4.B, 3.4.4.C</p>	
<p>Understanding(s):</p>	<p>Essential Question(s):</p>

<p>Students will understand . . .</p> <ol style="list-style-type: none"> 1. Sound is created by vibration that originates as a source and travels through a medium to get to a receiver. 2. Changes in the vibration level determine the volume and pitch of sound. 3. Sounds have identifiable properties and convey information. 4. Sound travels through solids, liquids, and gases. 5. The medium that sound passes through affects its volume and the distance over which it can be heard. 	<ul style="list-style-type: none"> ▪ What are the properties of sound? ▪ How can sound be used for communication? ▪ How are sounds made and is pitch and volume changed? ▪ To what extent is sound affected when it travels through different medium? ▪ How can pitch, volume, and the distance a sound can travel be modified or enhanced?
<p>Learning Objectives: Students will know . . .</p> <ul style="list-style-type: none"> ▪ The characteristics and properties of different sounds. ▪ A variety of sound sources and receivers. ▪ Sound originates from vibrating sources. ▪ How high-, low-, and medium-pitched sounds are created. ▪ Scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, and organizing. ▪ Sound travels through three states of matter: solid, liquid, and gas. ▪ The outer ear is designed to receive sounds. ▪ Pitch can be changed by changing the length or tension of the object vibrating at the sound source. ▪ Ears are designed to gather sound energy. ▪ Several variables affect pitch, including size (length) and tension of the vibrating object at the sounds source. ▪ How volume, distance, and pitch can be controlled. ▪ Pitch is how high or low a sound is. ▪ Differences in pitch are caused by differences in the rate at which objects vibrate? 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ▪ Discriminate sounds to gain information. ▪ Look for vibrations at the sound source, identify sound receivers, and compare sound volume to vibration intensity. ▪ Explain how different vibrations produce varied pitches of sounds. ▪ Observe and compare how the length of a vibrating sound source affects pitch. ▪ Observe and compare what happens when the tension applied to a sound source changes. ▪ Compare the shape of a megaphone and outer ears for directing sound through air. ▪ Compare the results of sound traveling through three states of matter: solids, liquids, and gases. ▪ Compare the pitch of a sound to the physical properties of the sound source.
<p>Name:</p>	<p>Dates: Rotating Basis</p>
<p>Course/Subject: Science, Grade 3</p>	<p>Unit Plan 4: Ideas and Inventions</p>

Stage 1 – Desired Results

PA Standard(s)/Assessment Anchors Addressed:

S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.

Reference: 3.2.4.C, 3.2.4.D

S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide.

Reference: 3.7.4.A, 3.7.4.B

S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.

Reference: 3.1.4.C, 3.2.4.B

S4.B.2.2 Identify that characteristics are inherited and, thus, offspring closely resemble their parents.

Reference: 3.3.4.C, 4.7.4.A, 4.7.4.C

S4.C.1.1 Describe observable physical properties of matter.

Reference: 3.4.4.A, 3.2.4.B

Understanding(s):

Students will understand . . .

1. Texture refers to the surface features of a material.
2. Pattern is a design or arrangement of objects.
3. Scientists are able to study the textures and patterns of various objects such as leaves, fingerprint, and paper through various techniques.
4. Chromotography refers to a physical method used to separate and analyze mixtures.
5. Symmetry is an arrangement in which the parts on opposite sides of a center line are the same.
6. Mirror images are the result of light reflected from a surface.

Essential Question(s):

- To what extent can the rubbing technique be used to learn more about objects?
- How do fingerprints act as your signature?
- To what are mirrors used for various applications in our daily lives?

Learning Objectives:

Students will know . . .

- The use of the rubbing technique allows for observation of things not easily seen.
- Veins transport materials in a leaf.
- Leaf-venation patterns can be organized into three types: parallel, palmate, and pinnate.
- Carbon printing is a technique used to make fine textures visible.
- No two people have the same fingerprints.
- Chromatography uses water to carry pigments from one place to another.
- The process of water moving through paper is called wicking.
- Light travels in straight lines.

Students will be able to:

- Use crayon and pencil rubbing to reveal patterns that are not readily visible on materials.
- Apply their rubbing techniques to make leaf rubbings.
- Use rubbings to identify and categorize leaves by type of veins.
- Invent an application for rubbing techniques.
- Make carbon prints of skin texture and fingertips.
- Classify fingerprints into the three basic patterns: whorl, loop, and arch.
- Use the carbon-printing technique to solve a mystery.
- Invent an application for the carbon

- An image produced by something that reflects, such as a mirror, is always reversed right to left.
- Mirrors can be used to determine symmetry in objects.
- How to record features of textured objects by making rubbings.
- Scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, and organizing.
- Carbon-printing is used to make fine textures visible.
- The characteristics of the three basic patterns of fingerprints: whorl, arch, and loop.
- How to invent an application for carbon printing.
- Paper chromatography is used to observe things not easily seen.
- Paper chromatography is used to reveal pigments in watercolor inks.
- How to compare chromatograms made with a variety of materials.
- How to discover lines of symmetry in familiar and unfamiliar shapes.
- How to use mirrors to manipulate light and images.

- printing technique.
- Use paper chromatography to separate and see pigments in watercolor inks.
- Conduct an investigation to determine the tool used to produce the pattern presented in a mystery chromatogram.
- Invent ways to use chromatography and try to answer more advanced questions about the behavior of pigments and inks.
- Use chromatography to solve a mystery.
- Invent an application for chromatography.
- Use mirrors to manipulate light and images, including reversals and lines of symmetry in geometric shapes and letters of the alphabet.
- Explore how to reflect images from one mirror to another and apply this knowledge by assembling a periscope.
- Investigate how to create multiple images by arranging two or more mirrors so that they reflect off one another.
- Invent ways to use mirrors to produce useful and aesthetically pleasing products such as a kaleidoscope.
- Identify an idea they would like to investigate in greater detail and to share their results with the rest of the class in a formal presentation.