

Southern York County School District Instructional Plan

Name:	Dates: Rotating Basis
Course/Subject: Science, Grade 2	Unit Plan 1: New Plants
Stage 1 – Desired Results	
<p>PA Standard(s)/Assessment Anchors Addressed:</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.1.3 Recognize and describe change in natural or human-made systems and the possible effects of those changes. Reference: 3.1.4.C, 3.1.4.E, 4.7.4.B, 4.8.4.A, 4.8.4.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.3.1 Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle). Reference: 3.1.4.A, 4.4.4.C, 4.6.4.A, 4.6.4.B, 3.6.4.A, 3.6.4.B, 3.6.4.C</p> <p>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</p> <p>S4.B.1.1 Identify and describe similarities and differences between living things and their life processes. Reference: 3.3.4.A, 3.3.4.B, 4.3.4.A, 4.3.4.C, 4.6.4.A</p> <p>S4.B.3.1 Identify and describe living and nonliving things in the environment and their interaction. Reference: 4.6.4.A</p> <p>S4.C.1.1 Describe observable physical properties of matter. Reference: 3.4.4.A, 3.2.4.B</p>	
Understanding(s):	Essential Question(s):

Students will understand . . .

1. Plants are alive.
2. Plants need water, air, nutrients, and light to grow.
3. As plants grow, they develop roots, stems, leaves, buds, flowers, and seeds in a sequence called a life cycle.
4. Bees and other insects help some plants by moving pollen from flower to flower.
5. Scientists use journals to record their observations.
6. Seeds are alive.
7. Seeds need water and light to develop into new plants.
8. Not all plants grow alike.
9. Some plants will die if cut near the ground while others will continue to live. New plants can grow from the stems of old plants.
10. Wheat and other cereals that we eat come from seeds called grains.
11. Plants have different structures that function in growth and survival.
12. Leaves, twigs, and roots develop on stems of the nodes.
13. Plants make food from light, water, air, and nutrients from the soil.
14. Potatoes are underground stems.
15. Bulbs are alive.
16. Bulbs need water to start growing.
17. Some parts of roots will grow into new plants; others will not

- What are the characteristics of a plant?
- How can a life cycle of a plant be recorded?
- What do brassica plants need to live and grow?
- What changes happen as brassica plants grow?
- How does a seed grow?
- How can we make a new plant from an old one?
- How do we keep our cuttings alive?
- Why do potatoes have eyes?
- What are bulbs?
- What other plant parts can grow new plants?

Learning Objectives:

- **Students will know . . .**
- The changes of a brassica plant as it grows over time.
- How to record observations using the techniques of drawing, labeling, and captioning.
- The sequence of changes in the life cycle of brassica.

Students will be able to:

- Prepare a class calendar to keep track of growth and development.
- Plant rapid-cycling brassica seeds in soil and place them under a lamp for continuous light.
- Identify the different stages of the life cycle including: germination, growth, flowering, and seedpod formation.

<ul style="list-style-type: none"> ▪ What happens when rye grass and alfalfa plants are grown, then mowed close to the surface, and then allowed to grow again. ▪ Sprout wheat seeds can grow in soda straws with pieces of paper towel to provide support and water. ▪ New plants can grow from cut plant stems when placed in water or soil. ▪ The parts of a stem that can be induced to produce new plants. ▪ Conditions that induce root growth on stems. ▪ Planted rooted shoots can produce new plants from the old. ▪ The role of potato eyes in producing new plants. ▪ How to initiate the growth of a new plant from a bulb. ▪ How to initiate the growth of a new plant from a root or part of a root. 	<ul style="list-style-type: none"> ▪ Harvest the seeds. ▪ Plant rye grass seeds and alfalfa seeds and compare their growth. ▪ Cut the lawn plants to simulate mowing and observe what happens. ▪ Plant wheat in soda straws and observe changes. ▪ Work with a part of a plant (stem, leaf, or a stem and a leaf) and put the parts in water to observe changes. ▪ Select stems that show promise for developing into new plants and plant them in soil. ▪ Cut white potatoes into pieces (modified stems) and plant them into soil. ▪ Plant onion or garlic bulbs, observe the emergence of the roots and the shoot, and take them home to plant where they will grow into mature plants. ▪ Cut carrots and radishes into three or four parts and plant them in vermiculite to see if they will produce new plants.
Name:	Dates: Rotating Basis
Course/Subject: Science, Grade 2	Unit Plan 2: Solids and Liquids
Stage 1 – Desired Results	
<p>PA Standard(s)/Assessment Anchors Addressed:</p> <p>S4.A.1.3 Recognize and describe change in natural or human-made systems and the possible effects of those changes.</p> <p>Reference: 3.1.4.E</p> <p>S4.A.1.1 Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems.</p> <p>Reference: 3.2.4.A, 3.2.4.C</p> <p>S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.</p> <p>Reference: 3.2.4.C</p> <p>S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.</p> <p>Reference: 3.2.4.B</p> <p>S4.C.1.1 Describe observable physical properties of matter.</p> <p>Reference: 3.4.4.A</p> <p>S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide.</p> <p>Reference: 3.7.4.A, 3.7.4.B</p>	
Understanding(s):	Essential Question(s):

Students will understand . . .

1. Matter is anything that has mass and takes up space.
2. Solids and liquids are two states of matter that can be identified and separated by distinct observable properties.
3. A solid has shape and is usually hard.
4. A liquid has no definite shape and always follows the shape of a container.
5. Scientists use their senses to observe the properties of matter.
6. Engineers are scientists who use their knowledge of materials to design useful objects and structures.
7. When solids mix with water they can change, remain unchanged, or dissolve.
8. Some materials have properties of both solids and liquids.
9. Scientists test materials in many ways in order to compare them to what is known.

- What is matter?
- How can matter be observed?
- What are the properties of solids?
- What are the properties of liquids?
- How are solids and liquids the same or different?
- How can understanding the properties of matter be useful to man?
- To what extent do solids change when they mix with water?
- How can mixtures of solid particles be separated?
- How can a mixture of water and solids be separated?
- What happens when water is mixed with different liquids?
- Is toothpaste a solid, a liquid, a mixture, or some other form of matter?

Learning Objectives:

Students will know . . .

- A definition of matter.
- Solids as different from other states of matter.
- How the properties of solid materials can have specific uses.
- Definitions of solids and liquids based on their observations and comparisons.
- The behavior of small solids in various and similar settings.
- What happens when solids and water are mixed.
- Water can be separated from a mixture through evaporation; what happens when liquids and water are mixed.
- Specific characteristics of liquids:
 - Liquids pour and flow.
 - Liquids take the shape of their container
 - The surface of liquids is level with respect to the ground.
- Specific characteristics of solids:
 - Solid materials come in all sizes and shapes.
 - Particles of solid materials can pour like liquids, but maintain their shape.
 - Solid materials can support denser materials on their surface.
 - Solid particles can be separated with a screen.
 - Solids change, remain unchanged, or dissolve when mixed with water.

Students will be able to:

- Construct a definition of liquids and define matter.
- Describe the properties of solids and liquids and develop vocabulary in order to communicate those properties.
- Sort a set of solid objects in a variety of ways to discover similarities among the solids.
- Design structures finding the best materials to use for each application.
- Investigate different liquids to develop the concept of a liquid.
- Observe the properties of solids and liquids through the use of senses.
- Identify and explain possible uses the solids and liquids based on their observable properties.
- Identify how solids and other liquids changes when mixed with water.

Name:	Dates: Rotating Basis
Course/Subject: Science, Grade 2	Unit Plan 3: Pebbles, Sand, and Silt
Stage 1 – Desired Results	
<p>PA Standard(s)/Assessment Anchors Addressed:</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</p> <p>S4.A.1.3 Recognize and describe change in natural or human-made systems and the possible effects of those changes. Reference: 3.1.4.C, 3.1.4.E</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</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.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature. Reference: 3.1.4.C, 3.2.4.B</p> <p>S4.B.3.1 Identify and describe living and nonliving things in the environment and their interaction. Reference: 4.6.4.A</p> <p>S4.C.1.1 Describe observable physical properties of matter. Reference: 3.4.4.A, 3.2.4.B</p> <p>S4.D.1.1 Describe basic landforms in Pennsylvania. Reference: 3.5.4.A</p> <p>S4.D.1.2 Identify the types and uses of Earth’s resources. Reference: 3.5.4.B</p>	
<p>Understanding(s): <i>Students will understand . . .</i></p> <ol style="list-style-type: none"> 1. Rocks are the solid material of the earth. 2. Rocks have a variety of properties, including color, hardness, shape and size. 3. Rocks can be sorted by their properties. 4. Rocks are all around us. 5. Rocks can be categorized by size. 6. Screens and water can be used to sort the sizes of earth materials. 7. Rock sizes include clay, silt, sand, gravel and pebbles. 8. Earth materials are natural resources. 9. The properties of different earth 	<p>Essential Question(s):</p> <ul style="list-style-type: none"> ▪ How are rocks similar and different? ▪ How can rocks be changed? ▪ How many ways can rocks be sorted? ▪ What rocks can we find around us? ▪ What are some of the smallest earth materials? ▪ How do people use earth materials? ▪ What does sand do for sandpaper? ▪ How else can sand be used? ▪ What can be made with clay? ▪ How are bricks made? ▪ What are the materials that can be found in dirt? ▪ How are soils different and alike?

<p>materials make each suitable for specific uses.</p> <ol style="list-style-type: none"> 10. Earth materials are commonly used in the construction of buildings and streets. 11. Soil is a mixture of earth materials. 12. Humus is decayed material from plants and animals. 13. The ingredients of soil can be observed by mixing soil with water, shaking it, and letting it settle. 14. Soils vary from place to place. 15. Soils have properties of color and texture. 16. Soils differ in their ability to support plants. 	
<p>Learning Objectives: Students will know . . .</p> <ul style="list-style-type: none"> ▪ Several different kinds of rocks. ▪ Properties of different rocks. ▪ Rocks interaction with each other and with water. ▪ A river rock mixture contains earth material particles of various sizes. ▪ To use particle size to separate and group river rocks. ▪ Properties of pebbles, gravel, sand, silt, and clay particles. ▪ Water can be used to separate sand and silt. ▪ Properties of dry and wet clay particles. ▪ Places where earth materials are naturally found and ways that earth materials are used. ▪ Different grades of sandpaper. ▪ How to use sand to make sculptures and clay to make beads, jewelry and bricks. ▪ Earth materials outside the classroom. ▪ Soil is a mixture of earth materials. ▪ How to separate the components in a soil mixture. ▪ How to record the results of shaking soil and water in a vial. ▪ Samples of soil outside the classroom. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ▪ Gather information about the rocks by matching the rock samples and rubbing them together. ▪ Wash their samples to see how the rocks change when they are wet and what happens to the wash water. ▪ Use ideas from the story, <i>Peter and the Rocks</i> to sort river rocks. ▪ Use sorting mats to play sorting games with the river rocks. ▪ Organize a classroom rock collection. ▪ Separate a river rock mixture, using a set of three screens. ▪ Use a student sheet to reinforce the idea of grouping rocks based on size. ▪ Separate sand particles from silt particles by mixing sand with water and allowing particles to settle. ▪ Investigate the properties of very small rock particles, clay. ▪ Find places where earth materials can be found naturally or as building materials. ▪ Make and compare rubbings of three grades of sandpaper. ▪ Mix sand with a cornstarch matrix to make durable sand sculptures. ▪ Use clay to make something decorative. ▪ Make adobe clay bricks with a mixture of clay soil, dry grass or weeds, and water. ▪ Put together and take apart soils. ▪ Collect soil samples in a variety of places. ▪ Study and compare soil samples.