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**TEKS K.7 Earth and space. The student knows that the natural world includes earth materials. The student is expected to:**

(A) observe, describe, compare, and sort rocks by size, shape, color, and texture.

(C) give examples of ways rocks and soil are useful.

**TEKS K.1 Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and uses environmentally appropriate and responsible practices. The student is expected to:**

(A) identify safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands and using materials appropriately.

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### **Background Knowledge**

The Earth materials focus for kindergarten exploration is rocks. We can identify, describe, compare, and sort Earth materials by their physical properties. Some physical properties we can use when observing, describing, comparing, and sorting Earth materials must include size, shape, color, and texture. Take every opportunity to put rocks into the hands of your students. Use tools such as magnets, pan balances, and hand lenses to let students observe and compare their rocks. Remind the students that their senses are essential tools in sorting, observing, and comparing their rocks. The use of proper vocabulary is essential. For example, be sure to correct any misconceptions between the concepts of soft and smooth.

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**Essential Questions**

What are Earth materials?  
(Resources that come from the Earth.)

What are some Earth materials that can be replaced easily or can be used again?  
(Plants, animals, soil, air, water)

How would our world be different without these materials?  
(Answers will vary.)

How do we use these materials in our everyday life?  
(Answers will vary.)

What are some Earth materials that seem to go on forever?  
(Wind, solar, water)

How would our world be different without these materials?  
(Answers will vary.)

How do we use these materials in our everyday life?  
(Answers will vary.)

What are some Earth materials that take a long, long, long time to replace?  
(Oil, natural gas, coal, minerals)

How would our world be different without these materials?  
(Answers will vary.)

How do we use these materials in our everyday life?  
(Answers will vary.)

What are some words that could describe a rock?  
(Answers will vary, **BUT** watch out for students wanting to use the word SOFT to mean smooth to describe the texture of a rock.)

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## Rock Collection/Rocks In A Bag



### **Objectives:**

To observe, describe, compare, and sort rocks by using the physical properties of size, shape, color, and texture.

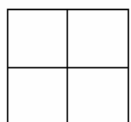
To verbally describe the physical properties of rocks by using correct scientific vocabulary.

### **Materials:**

- 1 Small brown paper lunch sack per student
- 1 White sheet of paper per student
- 1 Pencil per student
- 1 Rock per student
- 1 Primary balance

### **How to Conduct:**

- A. Have students start their own rock collection by bringing in different rocks they find around the school grounds, home, or in the community. Let the students talk about safe practices of washing hands after collecting the rocks around the school grounds, home, or in the community.
- B. At this point, you need to bring in “rock” vocabulary—words like smooth, rough, round, “color” words, etc. PLEASE, be sure that your students do NOT use the word “SOFT” when they mean “SMOOTH”. This is a common language error for students (even in 5<sup>th</sup> grade). Kinder is a good place to help STOP THE ERROR! Please consider writing the words on the board or making a bulletin board display of these words, because you will be using them again at the end of this activity.
- C. Give each student a brown paper lunch sack, and have students write their name on the outside of their sack.
- D. Have each student select one of their personal rocks and put that rock in the sack.

- E. Each student needs a partner, a sheet of white paper that has been folded into  $1/4^{\text{th}}$ , and a pencil.
- F. Students swap bags with their partner. They need to write the name on the sack in the first square on their white paper.
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- G. Without looking into the bag, each student will put their hand in the bag and feel the rock. Then, in the square labeled with the first name, they draw what they think they have felt in the bag.
- H. After everyone has finished, have the students swap bags again, repeat steps F and G. Continue until each student has “observed” 4 bags and drawn pictures.
- I. When everyone has filled their white paper with 4 drawings, have the students return the sack that they are holding to its owner.
- J. One by one, you go around the room. Take a sack and read the name on the outside. Have everyone that drew this rock stand by their desk. Then, you take out the rock, hold it up, and compare it to the drawings. Then, as a group, talk about the characteristics of the rock that you can all observe.
- K. Repeat step “J” until all students have had the chance to share their “rock in a sack”. Be sure to use the “rock” vocabulary that you introduced in step B.
- L. Next, tell the students that you want them to line up in order where the tallest student is first and the shortest student is last. Let the students work on arranging themselves in this order.
- M. Then, have the students return to their desks and get their rock. Tell the students that you want them to line up in order but use their rocks. Tell them you want the person with the biggest rock to be first in line and then go in order until the person with the smallest rock is last in line.
- N. After this activity is completed, discuss with the students that you have just “classified” the rocks in order of size. Then talk about some other ways that they could “classify” their rocks. (For example: smooth rocks vs. rough rocks; light-colored rocks vs. dark-colored rocks; rocks with layers vs. solid rocks, etc.)
- O. Let’s try one more. Provide each group of 3 students with a double pan balance.
- P. Students will determine the relative mass of their rocks compared to the other students’ rocks in the group by using the balance. Have two students compare, and then the third student compare the mass of his/her rock to the one that is heavier, and then to the one that was lighter. Guide students to tell how their rock’s mass compared to their lab partners’, (i.e., My rock is heavier than Sam’s, but lighter than Maria’s.) Record this information on the board or chart paper.
- Q. Talk about the different ways their rocks have been described. At the end of the activity, have the students identify the need to wash their hands. Have fun! Rocks Rock!

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## Growing Plants In Soil



### **Background Information:**

Soil is the top layer of the Earth's surface, consisting of rock and mineral particles mixed with organic matter. The amount of each affects a plant's growth, and the size of the particles controls how much water the soil can retain. Some common soil types include the following:

- **Sand** is made up of small, loose grains of worn or weathered rock; because of the loose nature of the grains, sand does a poor job of retaining water.
- **Silt** is generally known as one of the most fertile soils. Silt is made up of minerals and organic substances which are essential for the healthy growth of plants. Compared to sandy soil, this silt does a better job of retaining moisture.
- **Clay** a fine-grained, firm, compact earthy type of soil; the compact nature of clay, provides less space between the soil particles to allow proper drainage of water.
- **Loam** is a combination of varying proportions of clay, sand, and silt. Silt is considered a good soil for growing plants. The spacing of the soil particles is ideal for optimal retention and drainage water.

### **Objectives:**

Students will observe and describe 3 types of soil and compare their ability to grow plants. To conduct a simple investigation to determine which soil is better able to support plant growth.

To record data and compare data over an extended length of time.

### **Materials:**

- 3 identical planter pots with drainage holes
- A package of radish seeds
- 3 types of soil
- A graduated cylinder or measuring cup
- A wooden paint stir stick that you can mark off in centimeters
- Goggles per student

### **Safety**

Safety goggles (Students need to tell why the goggles are needed)  
Students should wash hands at the end of the investigation if handling soils.  
Student journals

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**How to Conduct:**

- A. Ask students identify and to give examples of ways soil is useful. List them on the board and talk about how soil is useful for growing plants.  
Gather 3 small pots (all should be the same size with drainage holes at the bottom) and fill and label each pot with one of the following:
- Soil from the school or your home
  - Plain sand (can be purchased from a home improvement store or garden center)
  - Potting soil from a garden center
- B. Sprinkle 5 radish seeds on top of each soil sample and cover with an additional 1/4<sup>th</sup> inch of soil.
- C. Label the pots for the type of soil each contains. Place all three pots in an area where they receive the same amount of sunlight during the day.
- D. Add the same volume of water to all three pots as needed.
- E. Ask the students to identify and explain the problem you are trying to soil by using 3 different types of soil to grow the same types of plants. (In which soil will they grow best?)
- F. Have students write down the day the seedlings first emerge from the soil, and have students measure how much each of the plants grows during the week. Relative height can be measured, and growth can be compared by marking the height of each plant on a wooden ruler with centimeter markings.
- G. Then compare the differences in growth once a week.
- H. Water lightly every day with ordinary tap water.
- I. Have students write down the day the seedlings first emerge from the soil, and have students measure how much each of the plants grows during the week.
- J. Have students compare and contrast how the different types of soil affected how the radishes grow.
- K. **IMPORTANT:** The concept of a “variable” is VERY difficult for students to understand. Even at this young age, it is important to remind the students over and over that you are doing the same thing to each plant, (same type of pot, same number, and type of seeds, same amount of sunlight, same type and amount of water each day) the only difference is the TYPE OF SOIL that you are using. The soil is called the “variable”.
- L. Ask students to give examples of ways water is useful related to plants. (Water helps plants grow by moving nutrients up from the roots. It helps to keep the plant stem and leaves stiff. It is useful to wash plants before eating them and to cook plants.)

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## Painted Rocks



### How to Conduct:

Have students paint rocks to create their own designs, animals, or insects.

1. Collect a variety of different-sized river rocks. Rocks with a smooth texture (river rocks) work best. This would be a good time to discuss why these rocks are smooth. These rocks come from the bottom of a river. As the water runs over these rocks they are weathered until they are smooth. Using the vocabulary “weathered” is essential. Weathering is the “breaking down” of materials such as rock into smaller pieces.
2. Wash and dry all the rocks.
3. Cover the students’ desks with newspaper, and have a selection of paintbrushes and different-colored tempera paints available for students to use.
4. Give each student at least one rock, and encourage them to create pets, insects, or any type of design that they think would look good on their rock.
5. Let the rocks dry and spray them with a clear varnish to protect the artwork.