

**Grade** 4

**Topic** Physical Setting

**Title** Rock and Roll

**Standards:**

- 4.1.5 Demonstrate how measuring instruments can be used to gather accurate information for making scientific comparisons of objects and events.
- 4.2.5 Write descriptions of investigations, using observations and other evidence as support for explanations.
- 4.3.5 Describe how waves, wind, water, and glacial ice shape and reshape the Earth's land surface the erosion of rock and soil in some areas and depositing them in other areas.
- 4.3.6 Recognize and describe that rock is composed of different combinations of materials
- 4.3.7 Explain that smaller rocks come from the breakage and weathering of bedrock and larger rocks and that soil is made partly from weathered rock, partly from plant remains, and also contains many living organisms.

**Objectives:**

**Cognitive:**

Students will record and illustrate information based on observations of mock rocks before and after affects of shaking with pebbles, small rocks, and water.

**Affective:**

Students will work cooperatively to classify and organize data from their observations.

**Psychomotor:**

Students will use hand lenses to describe mock rocks.

Students will use rulers to measure mock rocks.

Students will use electronic scale to determine weight of mock rocks.

**Materials:**

- See MOCK ROCK RECIPE for materials and assembly procedures (makes 18 5cm rocks)
- Small jars with lids one per child
- Mock rocks 2 per child
- ¼ cup of pebbles and small rocks per child
- Water
- 1 timer for teacher
- Hand lenses (one per child)
- Electronic scale
- Rulers
- Observation sheets

**Procedure:**

1. **Engage:** “Pretend you are a geologist studying a rock. How would you go about investigating the different properties of the rock? What would you look for?” *Teacher: Chart student ideas and try to illicit responses such as texture, color, shape, edges, size, mass/weight, smell, and hardness.*
  - a. Have students get pick up materials (hand lens, ruler, observation sheet, jar, one mock rock, cup of pebbles and rocks, and go to their work station.
  - b. Have students use hand lens to observe the mock rock and make predictions of the materials that make up the rock. (Students should not damage their mock during observation.)
  - c. Have students record observations on observation sheet and illustrate their rock.
  - d. Share ideas with group.
2. Student then measure and weigh mock rocks, recording data on the observation sheet.
3. Students put mock rock into their jar for safe keeping and join large group for brief discussion. Teacher asks students to share their observations and records observations on chart paper. Teacher asks, “It seems that there are many ideas about the make-up of these rocks. How could we find out what these rocks are made up of?” (*Students may say, “Hammer the rock and break it.” Teacher might respond, That's a good idea.” Then asks, “What in nature breaks down rocks since there are not hammers in nature?” For example wind, rain, water movement, temperature, ice, etc.) Discuss.*
4. Explain to students that they are going to simulate the breakdown of rocks by using a jar of small rocks and pebbles, and later in water.
5. Before beginning, students should predict what may happen to the mock rock when placed in the jar and shaken, recording predictions on observation sheet.
6. Students place one mock rock, pebbles, and rocks into the jar and close the lid.
7. The teacher sets the timer for one minute and instructs the children to begin shaking when the teacher says “go” and stop shaking immediately when she says “stop.”
8. Teacher starts the timer and stops after one minute.
9. Students look through the glass and observe the mock rock.
10. Students record their observations on the observation sheet.
11. Repeat this process but shake for three minutes and then stop.
12. Students should then record their observations.
13. Next, students fill the jar half way with water and place the rocks and pebbles into the water.
14. Students quickly put the mock rock in the jar, put the lid on the jar, and shake vigorously upon the teacher's command.
15. Teacher times for 1 minute.
16. Students record observations on observation sheet.
17. This is repeated for three minutes upon teacher's command and observations are recorded.
18. Students’ observations are discussed and recorded on chart paper by teacher.

## **ASSESSMENT:**

**Pre:** Teacher asks students what they know about rocks. Teacher asks students to record on paper what they believe rocks are, what rocks are made from, and how they came to be.

**Post:** Teacher asks students to record on paper, what they believe rocks are, what rocks are made from, and how rocks came to be. Teacher compares pre and post student responses to determine what students learned.

## Activity Sheet-Rock and Roll

**Name:**

**Mock Rocks:** Weigh your mock rock using a scale and record your measurement below.

Before: \_\_\_\_\_

After: \_\_\_\_\_

**Explore:** How can you observe a rock breakdown?

1 Shake mock rock and 2 small rocks in a jar with water for 1 minute. Look for changes in the mock rock. Record your observations below. Illustrate what you see.

2 \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Now shake the jar for 3 more minutes. Observe the mock rock. Record and illustrate what you see.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Explain your results: What differences did you notice from shaking the jar for 1 minute in comparison to 3 minutes? Record below.