

# BORN OF FIRE (MODIFIED FOR ADEED)

## INSTRUCTIONS



### Science Concept:

A volcano changes the surface of Earth when it erupts.

### Objectives:

The student will:

- explain how a volcano changes the surface of Earth;
- make a prediction about a volcanic eruption; and
- create a story about a volcano.

### GLEs Addressed:

#### *Science*

[4] SD2.2 The student demonstrates an understanding of the forces that shape Earth by identifying causes (i.e. earthquakes, tsunamis, volcanoes, floods, landslides, and avalanches) of rapid changes on the surface.

[4] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating.

#### *Writing*

[4] 2.1.3 The student writes about a topic by writing a story or composition with a beginning and middle and end with a concluding statement.

### Vocabulary:

**erupt** – violently release material: to eject material such as gas, steam, ash, or lava, usually violently, from within

**lava** – molten rock flowing from volcano: molten rock that originates in Earth’s mantle and flows from a volcano or a fissure on land or the ocean floor

**magma** – molten rock: molten rock deep within Earth from which igneous rock is formed by solidification at or near Earth’s surface

**mountain** – high point of land: a high and often rocky area of a land mass with steep or sloping sides

**surface** – outer part: the outermost or uppermost part of an object, the one that is usually presented to the outside world, and can be seen and touched

**volcano** – a vent/rupture in Earth’s crust: a naturally occurring opening in the surface of Earth through which molten, gaseous, and solid material is ejected

### Materials:

- Clay (an adult fist-sized chunk per pair of students)
- Red food coloring (several drops per pair of students)
- Vinegar (20 ounce or larger bottle)
- Baking soda (1 pound box)
- Small paper cups (one per pair of students)
- Paper plates (one per pair of students)
- *Volcanoes* by Franklyn Branley 2008

### Resources:

<http://avo.alaska.edu>

## Activity Preparation:

- Prepare a KWL chart.
- Prepare a vocabulary list with definitions.
- Pour 5-7 tablespoons of vinegar and a few drops of red food coloring in each paper cup.

## Activity Procedure:

Please refer to the assessment task and scoring rubric located at the end of these instructions. Discuss the assessment descriptors with the class before teaching this lesson.

### Gear Up

**Process Skills: *observing, inferring, communicating***

Complete a KWL chart about what students already know about volcanoes and what they want to learn about volcanoes.

Read the story *Volcanoes*. Discuss the story and be sure to show students what the area around a volcano looks like before AND after a volcano erupts. Show students pictures of areas (from the Alaska Volcano Observatory) where Alaskan volcanoes have erupted.

### Explore

**Process Skills: *Observing, communicating***

Tell students they will be making a volcano with a partner. Students will use clay to form a small mountain with a magma chamber inside and a hole in the top. Have students draw a picture of their mountain.

Students will put one tablespoon of baking soda inside the “magma chamber” and slowly pour in prepared, red-colored vinegar. Have students cause eruptions several times using various amounts of vinegar (more vinegar for faster and more explosive eruptions; less vinegar makes an “oozing” eruption, much like that of Kilauea in Hawaii).

After the reaction has taken place students should discuss what they noticed with their partner and then draw how the mountain has changed.

As students are exploring the teacher should walk around and take notes on what is being said. After the exploration is over, share and discuss with students what they said.

### Generalize

**Process Skills: *inferring, observing***

- Why do you suppose the liquid (lava) came out the top of the mountain?
- What did you see happening to the material inside the mountain?
- How did the material inside the mountain change? Outside?
- How was the land different after the liquid came out?
- What would happen to the things living on the surface of Earth after a volcano erupts?
- How would different shaped volcanoes affect the area differently?
- How is your volcano different from another one in class?

Ask students what they learned about volcanoes and use their responses to complete the KWL chart.

### Apply

**Process Skills: *observing***

Research some volcanoes in Alaska with an older sibling or other family member. You can checkout books in the school/town library or go to the USGS website at <http://www.usgs.gov>. Notice what volcanoes look like before and after erupting. Bring back pictures, or your own drawings, with written observations to share with the class.

# BORN OF FIRE

# RUBRIC

## Assessment Task:

Pretend there is an active volcano near your town. Draw and label what the area looks like now. Using a complete sentence, write at least one prediction about how the surface of Earth would change if the volcano erupted.

On a second piece of paper, draw and label the same area *after* the volcano has erupted illustrating at least two changes that were made to Earth. On that paper, write a short story of at least five sentences with a beginning, middle, and end about how the volcano changed the area.

## Rubric:

Objectives	GLEs	Below Proficient	Proficient	Above Proficient
Explain how a volcano changes the surface of Earth	[4] SD2.2	Draws and labels an area before and after a volcano, illustrating fewer than two changes.	Draws and labels an area before and after a volcano, illustrating two changes.	Draws and labels an area before and after a volcano, illustrating three or more changes.
Make a prediction about a volcanic eruption	[4] SA1.1	Does not make a prediction about how an erupting volcano can change the surface of Earth.	Makes one prediction about how an erupting volcano can change the surface of Earth.	Makes two or more predictions about how an erupting volcano can change the surface of Earth.
Create a story about a volcano	[4] W2.1.3	Writes a short story of four or fewer sentences with a beginning, middle, and end explaining how volcanoes change the surface of Earth.	Writes a short story of five sentences with a beginning, middle, and end explaining how volcanoes change the surface of Earth.	Writes a short story of six or more sentences with a beginning, middle, and end explaining how volcanoes change the surface of Earth.