

[Geology - Landforms]  
 [K-1: Basic]  
 [Grades 2-3: Advanced]

## BACKGROUND

Landforms are natural features of the Earth's surface. They are created by the movement of ice or water, earthquakes, lava flows, volcanoes, or by convection cells which cause the movement of the Earth's plates. (advanced levels) This plate movement is called plate tectonics.

Most mountains are formed from the heat and pressure that builds up under the Earth's crust. When two plates under the crust move towards each other, it causes uplift. This plate movement is called convergent. Mountains can also form by volcanism, or by erosion, which is when wind, rain, and ice change the surface of the Earth.

Plains are broad and nearly level, with little change in elevation. They are usually lower than the land around them and can be found on the coast or inland.

Valleys are depressions in the Earth, surrounded by hills or mountains. They are formed by water or ice erosion, and therefore are a natural trough that slopes down to a stream.

Hills are lower than mountains and are made from rock or sand debris deposited by the wind or glaciers. Hills can also be created by faults.

Volcanoes are mountains that sometimes vent or releases hot lava and steam from inside the Earth.

Oceans are large bodies of salt water that cover  $\frac{3}{4}$  of the Earth's surface.

Lakes are small bodies of water that are surrounded by land.

## BASIC LESSON

### Objective(s)

*Students will be able to...*

1. Know what mountains, plains, rivers, valleys, hills, volcanoes, oceans, and lakes are based on their physical characteristics. (Knowledge)
2. Classify picture examples of Earth's major landforms into the categories of mountains, plains, rivers, valleys, hills, volcanoes, oceans, and lakes. (Comprehension, Analysis)

### State Science Content Standard(s)

- 4.1: Describe and give examples of Earth's changing features  
 4.2: Describe the physical properties of the Earth's materials

### Materials

### Safety

#### From the Kit

- *What Is a Landform?* By Rebecca Rissman
- 7 sets of landform pictures
- Landform word cards
- Volcano model

#### Provided by Teacher

- Baking soda
- Vinegar
- Measuring spoons
- Tray

- [List any safety precautions here]

Key Vocabulary	Mastery Questions
<ul style="list-style-type: none"> <li>• Mountain</li> <li>• Plain</li> <li>• River</li> <li>• Valley</li> <li>• Hill</li> <li>• Volcano</li> <li>• Ocean</li> <li>• Lake</li> </ul>	<ul style="list-style-type: none"> <li>• <i>What do you know about landforms?</i></li> <li>• <i>What is a landform?</i></li> <li>• <i>What landforms are around where we live?</i></li> <li>• <i>What is the shape of each landform?</i></li> </ul>

### Detailed Plan

The teacher will read the book *What Is a Landform?* By Rebecca Rissman. Prior to reading the book ask -*What do you know about landforms?*  
 After reading, ask -*What is a landform?* And -*Can anyone tell me the name of one of the landforms from the book?* (The teacher will ask the students if they can remember all of the other landforms described in the book and will write these on the board)  
 -*Has anyone ever seen any of these landforms around where we live?*  
 -*What kind? Where?*

### Introducing the Terms

Hold up each word card and define the landform for the students. On a piece of paper folded into eight equal parts have the students write the name and draw a picture representing the landform.

- Valley – an area of lowland between ranges of hills or mountains
- Plains – an area of level or rolling treeless land
- Ocean – whole body of salt water that covers nearly  $\frac{3}{4}$  of earth
- River – large winding body of water
- Lake – a large inland body of still water
- Hill – land lower than a mountain, more rounded than a mountain
- Mountain – land higher than a hill
- Volcano – mountains that sometimes release steam and lava from the inside the Earth

To help students remember the landforms and to use for assessment you can teach them hand gestures: With a closed fist...point out the knuckles. The shorter ones are hills. The taller ones mountains. The area between are valleys. Open your hand and look at the palm. The flat palm makes the plains. You can use your imagination to form whatever ones you wish to teach. After teaching each concept, chant the names as each motion is made.

Review this daily for several days to help them remember.

OR

- For a MOUNTAIN, put the tips of both hands' fingers together and form a sharp tall point.
- For a HILL, round the sharp tall pointed fingers into a lower, softer form.
- For a VOLCANOE, use the mountain shape and then open a gap between the finger tips for a vent or cone to show where the release of lava or steam occurs.
- For a VALLEY, invert (upside down) your mountain or hill.
- For a PLAIN, put your hand out flat.
- For a RIVER, use your pointer finger and make an S shape to demonstrate the path of a river.
- For a LAKE, form a small circle with the pointer finger and thumb of one hand.
- For an OCEAN, form a large circle with the fingers and thumb of both hands and put a space or gap between them.

## Student Exploration

In groups of four, students are given a set of landform pictures and they must classify them into the categories of mountain, plain, river, valley, hill, volcano, ocean, and lake.

### Explanation

The teacher will lead a class discussion on why students put each landform in each category using common physical characteristics. On an overhead, whiteboard, or butcher paper, the teacher will lead students in creating a diagram that compares and contrasts each landform's characteristics. The teacher writes, or the students may take turns writing, while the students offer ideas for how each landform is similar and different from the others.

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## Volcanic Eruption Demonstration

Obtain the grey volcano model from the kit. Place it on a tray for easier clean up. State that the tray represents the earth's crust. Point out that the shape of the volcano is the result of the flow of lava and other materials through the break in the Earth's crust and the materials harden after each eruption. Gradually, the size of the volcanic cone increases and a volcanic mountain is formed.

Point to the opening of the volcano. This is called a crater. A crater is a depression at the summit or top of the volcano and volcanic materials will erupt through it.

### Eruption Procedure

1. Place the plastic model on a tray.
2. Put  $\frac{1}{2}$  to  $\frac{3}{4}$  tsp of baking soda in the bottom of the crater. (more is not better)
3. Add one tbs of vinegar to the crater.

As the volcano erupts, explain to the students how after each eruption the material hardens and the size of the volcano grows.

(There is another procedure for using dry ice on page six of the Geology Demonstration Kit papers found in the kit binder. Since obtaining dry ice can be difficult, this alternate procedure is suggested.)

## Assessment

To assess the students learning:

1. Do a visual check of the students' gestures when practicing shapes of landforms.
2. Look at drawings students made while learning the definitions.
3. Check student landform categories and listen to class discussion to determine depth of understanding.

## Resources

- <http://www.edu.pe.ca/southernkings/landforms.htm>
- [http://www.proteacher.org/c/320\\_Landforms.html](http://www.proteacher.org/c/320_Landforms.html)
- [http://www.coreknowledge.org/mimik/mimik\\_uploads/lesson\\_plans/1219/2\\_LandformsAllAround.pdf](http://www.coreknowledge.org/mimik/mimik_uploads/lesson_plans/1219/2_LandformsAllAround.pdf)
- Geology Kit Demonstration – found in the kit binder

## ADVANCED LESSON

### Objective(s)

Students will be able to...

1. Know what mountains, plains, rivers, valleys, hills, volcanoes, oceans, and lakes are based on their physical

characteristics. (Knowledge)

2. Classify picture examples of Earth's major landforms into the categories of mountains, plains, rivers, valleys, hills, volcanoes, oceans, and lakes. (Comprehension, Analysis)

3. Build and/or draw a model of a landform and label each with its appropriate name. (Application, Knowledge)

**State Science Content Standard(s)**

4.1: Describe and give examples of Earth's changing features

4.2: Describe the physical properties of the Earth's materials

**Materials**

**Safety**

**From the Kit**

**Provided by Teacher**

- See Basic Lesson

- See Basic Lesson
- Paper for landform books
- Crayons or colored pencils
- Salt
- Flour
- Food coloring
- Clay as an alternative

- Make sure students do not eat dough.

**Key Vocabulary**

**Mastery Questions**

- Mountain
- Plain
- River
- Valley
- Hill
- Volcano
- Ocean
- Lake

- *What do you know about landforms?*
- *What is a landform?*
- *What landforms are around where we live?*
- *What is the shape of each landform?*

**Detailed Plan**

For review or introduction to landforms, adapt the Basic Lesson for your needs and then proceed to the Advanced Lesson.

Complete one or both of the following activities:

**Activity 1: Landform Picture Books**

The students will draw a picture of each landform, labeling each with its appropriate name and write the definition of each landform in their landform book.

Procedure:

1. Using three pieces of paper folded in half and stapled along the middle, create blank landform books for the students. This can be done in advance.
2. Each student will label the first page with the title "Landforms" and their name. They may decorate the first page.
3. Each page of the rest of the booklet is for the name, definition, and student picture of each landform - mountain, plain, river, valley, hill, volcano, ocean, and lake.

**Activity 2: Building a Model of a Landform**

The students will build a landform (mountain, plain, river, valley, hill, volcano, ocean, and lake) out of salt dough (or whatever works for you such as modeling clay or play dough). The students can create their favorite landform or you can assign the landforms. This can also be done in teams of two. Grading will not depend on how well the models look, but on how well students can verbally explain it to an observer. Students will then find a partner and describe the characteristics of their landform and have the partner guess which landform the model represents.

Salt dough ingredients:

-2 cups flour

-1/2 cup water

-a few drops food coloring (added by the teacher)

-1 cup salt

-1 teaspoon oil

Large bowl (for mixing dough)

Modeling clay or play dough may be used instead.

### Assessment

Students will be assessed throughout the lesson by how they answer questions, how they participate in group discussions, and whether they completed their landform book by correctly labeling each landform and providing an illustration and definition for each or by creating the correct landform with the modeling clay or dough.

### Resources

[http://www.coreknowledge.org/mimik/mimik\\_uploads/lesson\\_plans/1219/2\\_LandformsAllAround.pdf](http://www.coreknowledge.org/mimik/mimik_uploads/lesson_plans/1219/2_LandformsAllAround.pdf)

## EXPLORE MORE

Using a popsicle stick and a bar of soap, have the students create one of the landforms and be able to point out the unique features of their landform. Your classroom will smell great!

<http://www.anoka.k12.mn.us/education/components/docmgr/default.php?sectionid=28505>

This website provides an advanced lesson and assessment demonstrating the ability of a student to understand and analyze the effect weather has on landforms.