

TLC Elementary School Lesson Plan The Living Earth

Subject

Earth Science

Grade level

3-5

Duration

One or two class periods

Objectives

Students will

- discuss glaciers and how they change the land;
- do an activity that illustrates how glaciers change the land, and
- make a class list of what causes changes to our planet's structure.

Materials:

- Paper and pencils
- Newsprint and markers
- Ice cube tray
- Water
- Sand
- Two plastic cups for each group
- Teaspoon
- Paper towels

Procedures:

Note: Before beginning the lesson, prepare the ice trays for the student activity. Make enough ice so that each group has two clear ice cubes and two that have been frozen with sand on the bottom. Then put the other materials in a central place so students are ready to begin immediately following the opening discussion.

1. Begin the lesson by asking students if they know what a glacier is. Write their ideas on the newsprint. As a class, arrive at a definition of a glacier. A sample definition follows: a large body of ice moving down a slope, pushing rocks and sand as it travels. Glaciers are responsible for new landforms; an example is Long Island in New York.
2. Tell students that they will participate in an activity that will demonstrate how glaciers can cause dramatic changes. Divide students into small groups; tell them to select one person in each group who's responsible for collecting materials for the group.
3. Have the designated students gather the materials for their groups. At this point, retrieve the ice cube trays from the freezer. Put two clear ice cubes in

one cup and two sandy ones in another for each group. Distribute the cups, two for each group.

4. Tell students to use a paper towel to pick up one of the sandy ice cubes. Instruct them to hold this ice cube against the side of the plastic cup and rub the bottom of the cube back and forth several times. Make sure each student in the group has a chance to rub the ice cube.
5. Ask students to carefully examine the surface of the cup where the ice cube was rubbed. Have students record their observations.
6. Then have students follow the same steps with the clear ice cube. Make sure they rub this ice cube with as much pressure and force as they used for the sandy one. Ask students to record these observations.
7. Have the groups clean up their areas as finish the activity. When all the groups have completed the activity, bring the class together for a discussion. Ask what happened after students rubbed the sandy ice cube against the cup. Ask what happened after students rubbed the clear ice cube against the cup. Students will probably observe that the sandy ice cube made a mark on the cup, while the clear one did not.
8. Discuss with the class what the results show. Help students understand that the sandy particles in the ice cube are what caused the mark on the cup. This rubbing motion is similar to the way glaciers cut deep depressions in Earth's surface.
9. Conclude the lesson by asking students if they can think of other natural forces that cause changes on the Earth's surface. Possible ideas include flowing water, wind, and the movement of tectonic plates or underground water. Record students' ideas on a sheet of newsprint. Keep the list available so students can add additional ideas.

Evaluation

Use the following three-point rubric to evaluate students' work during this lesson.

3 points: Students participated actively in class discussions; worked well with their groups to complete the activity; and drew conclusions from the results of the activity.

2 points: Students participated in class discussions; worked with their groups to complete the experiment; and drew some conclusions from the results of the activity.

1 point: Students participated only minimally in class discussions; did not work well with their groups and did not complete the activity; and had difficulty drawing conclusions from the results of the activity.

Vocabulary:

canyon

Definition: A deep, narrow valley that often has steep sides

Context: Cut by the Colorado River over millions of years, the Grand Canyon is a spectacular example of natural forces carving the Earth.

erosion

Definition: The wearing away of the land by flowing water, the movement of glaciers, or by wind

Context: Flowing water and strong winds are responsible for much erosion of the land.

glacier

Definition: A large body of ice slowly moving across the land, pushing sand and rocks as it moves

Context: The movement of glaciers is responsible for the formation of Long Island in New York.

landform

Definition: A feature of Earth's surface that emerged as a result of natural causes

Context: Mountains, canyons, and valleys are examples of landforms that occurred as a result of natural forces.

natural forces

Definition: Occurrences on Earth attributable to nature, not caused by the actions of people

Context: Earthquakes and volcanoes are destructive natural forces that can cause extensive damage to buildings and can injure people caught in their path.

tectonic plates

Definition: The large slabs of Earth's crust and outermost mantle that lie beneath the surface

Context: Earth's tectonic plates have been moving continually for billions of years.

Academic Standards

This lesson plan addresses the following standards from the National Science Education Standards:

Grades K-4

Earth and Space Science: Properties of earth materials; Changes in earth and sky

Grades 5-8

Earth and Space Science: Structure of the earth system; Earth's history

Credit

Marilyn Fenichel, education writer and editor