MANCHESTER COLLEGE
Education Department

LESSON PLAN by Dawa F Sherpa

Lesson: Glaciers and how they form lands **length:** one or two class period
Age or Grade Intended: Fourth Grade

Academic Standards:
4.3.5 Describe how waves, wind, water, and glacial ice shape and reshape Earth's land surface by the erosion* of rock and soil in some areas and depositing them in other areas.

Performance objectives:
Given the materials, students will list at least one reason how glaciers change the land from the experiment and discussion in the class.
Students will make a class list of what causes changes to our planet's structure by doing the experiment within the group with 100% accuracy.

Advanced preparation by Teacher: the teacher has to have the below material to this activity

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

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.

Procedure:

Introduction/Motivation: (Engage) Begin the lesson by asking questions such as
What is glacier? (Bloom's Knowledge)
Could you list some ideas on glacier on the board? (Bloom's Application)

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 and Northern Indiana.

Tell students that they will participate in an activity that will demonstrate how glaciers can cause dramatic changes. (Bloom's Application)

Step-by-Step Plan: (Encourage) Divide students into small groups; tell them to select one person in each group who's responsible for collecting materials for the group (Intrapersonal).

1. 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.
2. 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.(Interpersonal)
3. Ask students to carefully examine the surface of the cup where the ice cube was rubbed. Have students record their observations.(Bloom's Analysis)
4. 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. (Body-Kinesthetic)
5. 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 (Blooms' Synthesis) . 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. They have to write what they come up with the both the experiments.(Linguistic)
6. 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. (Engage)

Closure: 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. (Engage). If they are near the area that is formed by the glacier then a field trip to that area would be exciting for the students. (Naturalist)

Adaptations/ Enrichments: When grouping students make sure to put student who needs help with the other students who are good. Students who are not really good can explain the teacher the experiment and the result orally. Student who had already done this experiment is required to facilitate the students only when the other students need help. He/she should not tell the students what happens next in the experiment while they are doing.

Assessment: Students will be assessed on the group discussion; worked well with their groups to complete the activity; and drew conclusions from the results of the activity. They have to write what they come up with the both the experiments

Lesson idea from **http://school.discovery.com/lessonplans/programs/livingearth/**