Ice Wedging

Summary

Students make a model of a weathering process in nature known as ice wedging.

Time Frame

2 class periods of 30 minutes each

Group Size

Pairs

Materials

- plaster of Paris
- balloon
- water
- syringe (optional)
- paper cup
- student worksheet (attached)

Background for Teachers

Time Needed

: 30 minutes one day, 30 minutes the next day.
Students use Plaster of Paris and balloons to mimic what happens when water enters a crack during the day. The top surface freezes over the crack at night, trapping water below. As the water below freezes, it expands, cracking the rock.

Instructional Procedures

Plaster of Paris can be purchased by the bag at most hardware stores. Use smaller paper cups (250 mL) and small water balloons.
Caution students not to allow plaster to go down sink drains. They should NOT wash the spoons off or pour excess plaster down the drain. The plaster will chip off a metal spoon after it hardens or you can use plastic spoons and throw them away.
A good way to introduce this activity is to talk about what happens to roads in Utah in the winter when it freezes in the night and melts in the day. Student may have heard their parents discus potholes in highways and undoubtedly know that roads get them. This is caused by ice wedging and car tires enlarging the pavement chips.
The most important thing for good results is to get the water balloon the right size (about 1/2 the width of the cup) and to get it centered in the plaster.
You might wish to make this a three day process and allow students to see their cup after the plaster has hardened but before you place it in the freezer.
Emphasis to students that the plaster hardens, not dries. If you mix the plaster early enough in the class period student will be able to feel the plaster heat up as this chemical change takes place. It will be a good place to remind students about characteristics of chemical change.
The cups need to be frozen overnight.
Provide students with a tray to unwrap the cups in or you will have small pieces of plaster everywhere.
Make one control cup for your classes. It should NOT have a water balloon in it.

Assessment Plan

Scoring Guide:

Students participate in group and clean up ……..4
Students record data…….4
Students correctly answer analysis questions……..4

Answers:

In nature there are no water balloons. The water in a crack freezes from the outside in, which is how the water is trapped.
Ice wedging is weathering because it makes rocks smaller
The control shows that it was the water that cracked the rock not the freezing plaster.
Water expands when frozen.
During the day liquid water flows into the crack. At night the top surface of the water freezes trapping water below. As the water below freezes, it expands, cracking the rock.
Students write thoughtful conclusion……..4

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

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