

Liquefaction Lab

Summary

Students will design a lab to discover how and why liquefaction would occur and relate to how that would affect the biosphere.

Time Frame

1 class periods of 60 minutes each

Group Size

Small Groups

Materials

Each group of 4 needs:

- 2 sturdy paper cups
- 2 plastic bowl or other container
- water
- marble or other small heavy object
- graduated cylinder
- scissors
- sand

- [student worksheet](#)
(attached)

Student Prior Knowledge

Students should be know that tectonic movement causes earthquakes and earthquakes can cause damage at the surface of the Earth.

Instructional Procedures

Ask student to describe what happens when you stand in mud and shake your feet. They may know that you will sink into the mud. Define this process as liquefaction.

Demonstrate the lab set up to the students

- cut off the bottom of a paper cup, turn it upside down in a bowl and fill it to the top with fine sand (do not pack or disturb the sand)
- pour water into the bowl, not the cup, and allow it to soak to the top of the sand. The amount of water varies with the size of the cup, approximately 100 ml
- place your marble on the sand
- strongly flick the side of the cup and the marble should sink, water will spout from the sand, the sand will compact and parts will fall.

Have students brainstorm variables to test then choose one or two from the list to test (flick strength, amount of sand, amount of water, type of soil, type of "building", soil compaction). Allow students to run lab and make conclusions. Students should set up and run a control based on your demonstration.

You can collect data a few different ways: count the number of flicks until the marble sinks or water spouts occur, time how long the above takes or make visual observations.

Each group should report on their results and conclusions.

Create a class conclusion based on each groups conclusions.

Each student should answer the analysis questions.

Assessment Plan

Scoring Guide

:

1. Students set up and perform experiment.....4
2. Students collect and record data.....4
3. Students correctly answer analysis questions.....4

Answers:

1. Loose sediment in the soil, old lake beds are ideal; water in the soil, strong earthquake.
2. This affect cities by damaging foundations and causing floods, it can cause rivers to change course which can leave some wildlife without a home.
3. Yes, part of Salt Lake County is at high danger because it sits on the bed of Lake Bonneville and more recently parts of the Great Salt Lake.
4. Governments can limit building on areas of high danger.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

[Utah LessonPlans](#)