Rock Density - Application Lab

Summary

Students will use water displacement and triple beam balances to calculate the density of different kinds of rocks that are common on Earth.

Time Frame

1 class periods of 60 minutes each

Group Size

Individual

Materials

- rocks from identification sets (approximately 3 cm in width, 3 cm in height, and 3 cm in length)
- zip lock bags with 5-7 rocks (sandstone, limestone, granite, basalt, pumice or aa lava, quartz, etc.)
- calculators
- overflow cans
- water
- graduated cylinder
- triple beam balances
- student worksheet

Student Prior Knowledge

mass, volume, density

Instructional Procedures

If you haven't already used water displacement to find volume:

Lead class discussion about volume. Include reminders of the way students found volume in previous unit -- liquids can use graduated cylinders and you can calculate the volume of many solids by multiplying their dimensions (review cubes, spheres, and rectangular prisms.)

Introduce a problem. How do you find the volume of a solid that has a really strange shape? Why can't you just take height x width x length?

Ask students to visualize what happens when they put water in the bathtub and then get in themselves. What makes the water level do that? Link the rise of the water with the amount of room their body takes up. If they were to completely fill the tub, then step in and sink down into the water so nothing showed above the top of the water, what would happen to the water in the tub? How much would come out?

Show students the overflow cup and demonstrate how they will fill the cup with water, put the rock in, and catch any overflow in the graduated cylinder.

Discuss density of rocks

Do all rocks have the same density? How can you tell? Explain that geologists sometimes use heft as a general gauge of density, but they are going to calculate the density more accurately.

Why do different kinds of rocks have different densities? Help students think about the types of atoms they are made of and how closely they were packed in the formation of the rock.

What difference would density make with different kinds of rocks? Remind them of the density column lab. If you had two kinds of rocks with different densities, might they float at different levels in the same way? What form would the rock have to be in? When and where is it in that

form?

Assessment Plan

Check for completeness and correct answers.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

Utah LessonPlans