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POROSITY

 LAB

**Directions:** This lab needs to be written as a lab write-up and will be graded with the lab rubric. Each section must be titled and organized appropriately (ex. **Introduction**). Work with your table partner for this lab. Each person must complete a lab write-up.

**Introduction**

 Porosity is the volume of open spaces (void space) in rock or soil. Rock materials that have higher porosity can hold more water. In this activity you will plan an experiment to determine which rock materials have greater porosity. The rock materials are sand, gravel, clay and mixed sand and gravel. **Answer these questions in your introduction.**

1. What is the definition for the term “volume?”
2. Porosity can be expressed as a percentage. What formula would you use to determine the percentage of pore space in a particular rock?
3. If a rock absorbs 25 grams of water, what volume of water has it absorbed? \_\_\_\_\_\_\_\_\_\_\_ ml

**Hypothesis**

Write a hypothesis for your experiment in If…and….then format. For example: If I compare all sand, gravel and clay materials, and the experiment is controlled, then sand will have a higher porosity.

**Materials and Methods**

**Materials available:** 500 ml beakers, graduated cylinder, triple-beam balance, thermometer, sand, gravel, clay, mixed sand and gravel.

**Methods:** Devise a step-by-step procedure (methods) in order to test your hypothesis. The procedure must include independent variables, dependent variables and controls.

**Observations (data collection)**

 **Create a data table to organize your observations. Below is an example of a data table.**

|  |  |  |  |
| --- | --- | --- | --- |
| Rock Material | Volume of the void | Total Volume | Notes |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Analysis**

**Calculate the porosity for all four samples. Use the equation below and show all work (write out the equation each time).**

Porosity = (Volume of the voids/Total volume) x 100%

**Conclusion**

**Answer these questions in your conclusion section of your lab write-up in complete sentences.**

1. Did you reject or accept your hypothesis? Use data to support you answer.
2. Why would round rock material have better porosity than flat rock material?
3. A student placed a dry 150 ml sample of sandstone in a 500 ml beaker filled with 400 ml of water overnight. When the sandstone was taken out, the water level dropped to 350 ml. What is the porosity of the sandstone (show work)?
4. Would you want the rock material beneath a landfill or sewage lagoon to be permeable, or impermeable? Explain why.
5. Why do parking lots tend to have a lot of puddles and “standing water?”
6. Diagram an aquifer, include the type of rock material, water table, impermeable layer and one well for a house.
7. Explain how a pollutant from a neighbor affects your water supply.