

Fill'er Up



QUESTION: How does the air space in a given amount of gravel compare to the airspace in the same volume of sand?

MATERIALS:

- | | |
|--------------------|--------|
| calculator | gravel |
| beaker (100 mL) | sand |
| graduated cylinder | water |

PROCEDURE:

1. Estimate the volume of air space (mL) in 100 mL of gravel.
100 mL of gravel contains _____ of air space.
2. Measure exactly 100 mL of gravel in a graduated cylinder.
3. Pour the gravel into the 100 mL beaker.
4. Fill the graduated cylinder with exactly 100 mL of water.
5. Pour the water into the beaker that has the gravel until it is exactly to the top of the gravel. **DO NOT GO OVER THE TOP OF THE GRAVEL.**
6. Record the volume of water used.
7. Repeat steps 2-6 two more times. Record the volume of water used each time.
8. Use the formula below to calculate the percent of air space in the gravel.

average volume of water ÷ volume of gravel (100 mL) = % of air space

9. Clean and dry the graduated cylinder and beaker thoroughly.
10. Estimate the volume of air space (mL) in 100 mL of sand.
100 mL of sand contains _____ of air space.
11. Measure exactly 100 mL of sand in a graduated cylinder.
12. Pour the sand into the 100 mL beaker.
13. Fill the graduated cylinder with exactly 100 mL of water.
14. Pour the water into the beaker with the sand until it is exactly to the top of the sand. **DO NOT GO OVER THE TOP OF THE SAND.**
15. Record the volume of water used.
16. Repeat steps 11-15 two more times. Record the volume of water used each time.
17. Use the formula below to calculate the percent of air space in the sand.

average volume of water ÷ volume of sand (100 mL) = % of air space

18. Clean and dry the graduated cylinder and beaker thoroughly.
19. Construct a line graph showing the volume of air space and the percent of air space in 100 mL of gravel and sand.

PS – Activity #10

DATA:

	VOLUME OF WATER	VOLUME OF AIR SPACE	% OF AIR SPACE
Trial 1			
Trial 2			
Trial 3			
Average			

QUESTIONS:

1. Which has more air space between the grains, gravel or sand?
2. What is the relationship between the amount of air in a sample and its relative density?
3. How would the volume of air space present in 100 mL of clay compare to the volume of air space in sand or gravel?
4. Many animals live in the spaces between the gravel and sand present in stream and river beds. They cannot survive if silt (very fine sediments) is washed into their habitat. Why do you think this is so?
5. What type of measurement is a graduated cylinder useful for?

PS – Activity #10

