

## How much water can rocks hold?

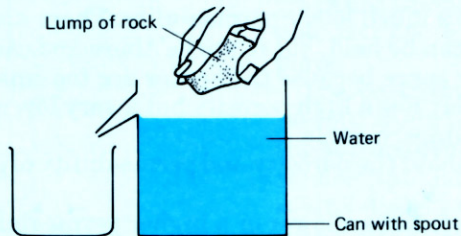


Fig. 11

Choose a lump of chalk or an easily crumbled sandstone or limestone with a mass of a few hundred grams. Make sure that it is dry by storing it in a dry place or by heating it in an oven at  $150^{\circ}\text{C}$  for several hours. Find the mass of the dry lump using a balance.

Put the lump into a bowl and cover it completely with water. After about a day, take the lump out of the water and dry the outside of it. Find the new mass of the lump.

- What is the increase in mass?

This increase must be due to the water that the rock is holding between its grains.

Increase in mass (g) = Volume of water soaked into lump ( $\text{cm}^3$ )  $\times$  1 ( $\text{g}/\text{cm}^3$ ). (The density of water is  $1 \text{ g}/\text{cm}^3$ .)

The volume of water soaked in must be a measure of the volume of air space in the rock.

Lastly, add the lump to the water in the special can shown in Figure 11.

- What is the volume of the water pushed out? This is the same as the volume of the lump.
- Work out the porosity of the rock as follows:

$$\text{Porosity} = \frac{\text{Volume of water soaked in}}{\text{Volume of lump}} \times 100 \%$$