Science on the Shelves Project

‘Celery Rocks!’ Activity Sheet

In this activity, you can:

- learn how to dye a piece of celery like a stick of rock and then,
- find out what this tells us about how plants transport water.

How to make your celery rock

Blackpool rock, made from celery?

Well, not quite, but you can customise your own celery with stripes of colour running along its length just like the lettering in a stick of rock. It’s best to use a short piece of celery with the leaves still on and place it in a few centimetres of food colouring in water. Leave it for a day or so then carefully cut into the celery to see where the colour has reached.

Have a look at the one we prepared earlier, using red food colouring:

You could split the celery lengthways along the lower half and place each side in a different colour to make your own multi-coloured celery stick!

Here’s one we did with red and green food colouring:

The science bit – how plants transport water

One of the reasons that even wet summers can still end in drought is the efficiency of plants at moving water from the ground to their upper reaches where it evaporates from the surface of the foliage. The process is called **transpiration** and it's essential for moving water to all parts of plants, even to the tops of the tallest trees. The experiment with a stick of celery reveals that this happens through special tubes, called **xylems**, which take up the food colouring.

The process is accelerated by evaporation from the celery leaves and you can make it go even faster by using a hairdryer on the leaves. Compare the rate at which the colour is taken up between three celery sticks: one with no leaves, one with leaves, and one with leaves applying a hairdryer. Using the hairdryer simulates a warm, windy summer's day when water in the ground from a recent downpour can soon find itself being transpired back into the atmosphere.

You can imagine with the tallest trees that each water-carrying xylem contains a continuous, thin column of water over a hundred feet in length and reaching from the roots to the uppermost leaves. The effect of evaporation at the top of the tree literally pulls this column of water up the tree. The ability of these thin columns of water to be pulled in this way – without breaking – is attributed to the special forces between the water molecules in the liquid; this is called **capillary action**.