

PLANTS (teacher's notes)

ROOTS






About roots:

Carrots are roots: why are they swollen?

- Annual plants complete their cycle of life (germination, growing, form flowers, pollination and producing seeds) in a year.
- Biennial plants complete their cycle of life in two years. Carrots, beetroots... are roots from biennial plants; in the first year the seeds sprout, they grow leaves and a fleshy root (where the plant stores the food made by the leaves) and in the second year the plant uses the stored food to go on growing, to bloom with flowers and to produce seeds. So the carrots and beetroots we eat are harvested the first year.

Activity 1: Let's compare roots!

A) The pupils need, for example, a carrot or beetroot because they have a tap root, a grass plant because they have a fibrous root and a garlic bulb, a tulip bulb or gardeners' cuttings with roots after being in water for a while because they are adventitious roots.

A	B	C	D	E
				
radish		tulip	ivy	mangrove

B)

	A	B	C	D	E
1.- A tap root is a large root with small lateral roots growing out of the large root.	✓				
2.- Fibrous roots are many equal-sized roots, with small lateral roots growing out of the equal-sized roots.		✓			
3.- Adventitious roots grow directly from a stem.			✓		

4.- Aerial roots normally grow out of the plant above ground not underground.				✓	
5.- Prop roots are aerial roots that grow from a stem and go down into the ground.					✓

C)

- Picture A: The big radish, in the example, a carrot, a parsnip... are roots.
- Picture B: (See the definition in part B).
- Picture C: In the example given the roots are white. The bulbs are not the roots, they are stems.
- Picture D: You can see them on the left hand side of the photograph and they are short and brown.
- Picture E: (See the definition in part B)

Activity 2: Choose a root, draw it and colour it.

The pupils can do this activity as homework to take as much time as they need.

Make them realize that a root has an epidermis to protect it as our skin protects our bodies.

Activity 3: Label the root on activity 3.

- Main root: A large root with smaller roots.
- Lateral root: The smaller root that grows out of the main root.
- Root hairs: Very small hairs near the tip of each root.
- Tip of the root: The end of every root (covered with a cap to protect it).

You can find a helpful picture in:

<http://www.uic.edu/classes/bios/bios100/labs/plantanatomy.htm>

Activity 4: Let's think about root hairs.

It would be better if the children can look at real roots.

If the pupils look, for example, at a bought carrot it will difficult to find them.

Guide the pupils to see that there are lots of root hairs that increase the absorbing area of the root.

Activity 5: Let's think about the tip of a root!

You can go to the address <http://www.ffp.csiro.au/research/mycorrhiza/root.html>

C) The end is pointed.

Then you can ask them if this shape can be useful to grow through the ground.

Activity 6: Why are roots important?

- They prevent the plant from moving.
- They absorb and transport water.
- They absorb and transport minerals.
- Some roots store food (as in swollen tap roots, e.g. carrots).
- Some roots, aerial roots, cling to other plants, walls...