NATURE

Activity N02

Theme
Class activity (CA). Students consider what resources a plant needs to survive. The investigation starts with light, then moves on to water, soil and heat.

Objectives
Teaching students, through experiment and observation, about the plants requirements in terms of light, water, soil and heat, and hence the importance of protecting these natural resources.

Curricular Strands
SESE, Science–Plant and animal life; Investigate the factors that affect plant growth; Environmental awareness and care

Skills
Questioning, observing, predicting, investigating, identifying

Time
30 minutes to set up; 2 x 15-20 minutes sessions to follow up

Links to Green schools
Importance of plants to our environment

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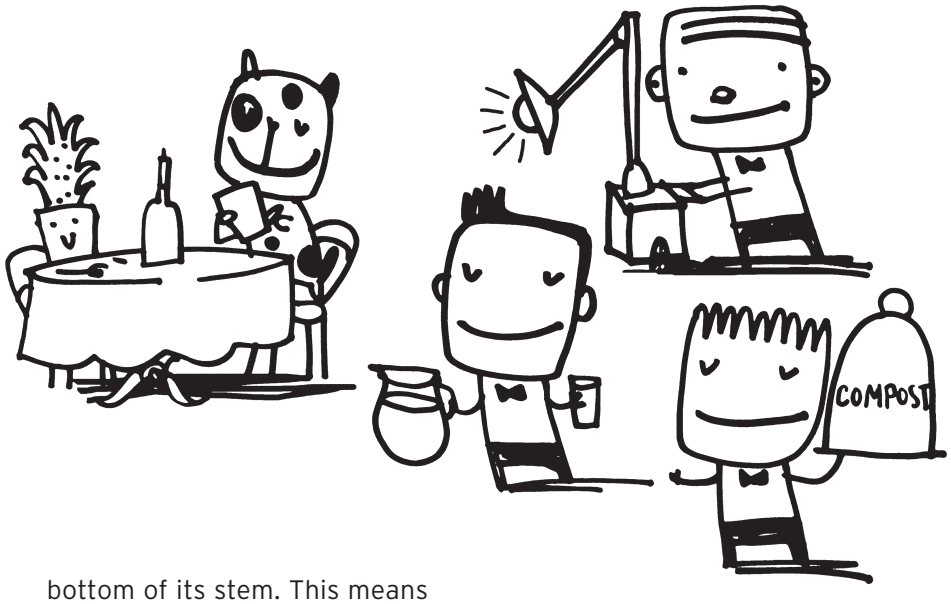
WHAT DOES A PLANT NEED TO GROW?

WHAT YOU NEED

- Clear plastic container
- A coloured container that does not allow light through
- Cocktail sticks
- Coloured paper

WHAT YOU DO

1. Brainstorm with students about the different resources a plant needs to grow (the main ones are light, heat, water, soil and air).
2. Tell them that you are going to test how light affects the way a plant grows.
3. The plant you are going to test is grass.
4. Some of the students may not have thought of grass as a plant before. Explain that grass is different to other plants; instead of growing from the tips of its stems like most plants, grass grows from the bottom of its stem. This means that cows can munch on it in the field without harming the part of the plant that grows.



5. Explain that you are going to compare:
   - how grass grows when it has no covering
   - when it has a clear covering (like a greenhouse)
   - when it is covered by a container that lets no light in.
6. Show the students the containers they are going to cover the grass with. Ask them to note down their predictions of what might happen to the grass covered by each container.
7. Pick an area of grass that gets a reasonable amount of sunlight but is out of the way (e.g. not a play area). Place the containers upside down on the grass and mark their position with a number of cocktail sticks.

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Continued →

Note: Break off one end of the cocktail sticks: push the sharp end into the ground and leave the blunt end sticking up. You could stick small pieces of coloured paper to the end of the sticks or press knobs of bright plasticine over the blunt ends to make the cocktail sticks more visible.

8 Using more cocktail sticks, mark out a similar sized area on the grass beside the containers (see note above).

9 The patches should be watered every two days, lifting the containers for watering. Students should note if it rains, as the open patch of grass will get more water.

10 Leave the containers in place for two weeks and return to see how the grass growth has been affected.

Questions

1 Which grass patch has grown the most? Which has grown the least?

2 Did the grass under the clear container grow more than the grass not covered by a container? Why do you think this happened? (The grass in the clear container should grow more as the container acts as a greenhouse).

3 What colour is the grass that was covered with the coloured container?

Note: This experiment will work best in spring or summer, when the grass is growing. In winter a similar experiment could be done on the window sill with the above containers and germinated cress seed.

Go further

1 Light is just one of the resources a plant needs to grow. Try out some of the investigations below to see what else a plant needs to survive.

2 Remember if you're testing one requirement, all the other requirements should be the same for each patch to ensure that this is a fair test. For instance, if you're testing the need for water, try to make sure that each patch is getting the same light, soil and heat.

Water	Grow some cress seeds on a thin layer of compost in a tray. Take three patches of grown seedlings: one that you water every day, one that you water every third day and one that you don't water at all. Ask the class to predict the results. What happens?
Soil	Plant four patches of cress seeds: one on a sheet of kitchen paper, one on a thin layer of garden compost, one on pencil shavings and one on newspaper. Keep all four damp for a few days. Where do the seeds grow the best? Ask the class to make predictions.
Heat	Grow some cress seeds in three small pots. When seeds have germinated and plants appear, place one pot in a warm location, one in a cold location and the other at room temperature. The students could use a thermometer to take the temperature in each area. Keep a class diary of the plant growth and temperature over one week.