



Conservation

MODULE 8

Observing and scoring germination

TIME

1 hour & 30/60 days (after the germination experiments)

MATERIALS

Previous class results
Seed germination tiles
Glue
Petri dishes of seeds from Module 7C
Tweezers
Plantlabels
Plastic flower pots
Peat free potting compost
Disposable gloves
Photocopy of sheet C12

SKILLS

Laboratory skills
Critical analysis of results

KEYWORDS

Results
Seedling
Germination

CROSS-CURRICULAR

ACTIVITY

Maths
ICT

Overview

This activity can only be completed about 30 days after the germination experiments in Module 7C. During the activity, children will record germination in the trials set up in the previous experiment, plotting the observed results and analysing them scientifically.

The second activity encourages children to pot up any germinated plants, to grow on in school and later in a greenhouse or garden.

Aims

To apply scientific methods through observation and analysis of results.
To test previous hypotheses about germination experiments.

Teaching sequence

1. The children work with their germination experiments set up the month before.
2. Hand out the petri dishes containing the germination experiments to each child.
3. They count the number of germinated seeds in their own petri dish and fill in the results and other details required on C12 'Outcomes of Germination Experiments'.
4. Enlarge and print out the class results table for all the germination outcomes (see Media Gallery Conservation M8 Class results); alternatively ask the class to make a large table for their joint results. This should be used to compile and display all the class germination results.
5. Children are given copies of the 'single seed germination' tiles (see example 1 in Teachers' notes, large copy in the Media Gallery Conservation M8 Seed germination tiles) and asked to cut up a number of single seed germination tiles.
6. Using the correct number of tiles to represent their germinated seeds, children glue their tiles onto the column of the large results table, which represents the conditions under which the seed germinated successfully. See example 2 in the teachers' notes below, large copy in the Media Gallery Conservation M8 Class results example. It is important to keep each child's results in a separate upright column, as part of the larger column, e.g. if a child obtains 5 germinated seeds at the 25°C temperature treatment he/she puts 5 tiles in an upright line into the 25°C box; another child with 3 germinated seeds should glue their 3 tiles in an upright column next to the first child etc. This will display the results in an easily readable way.
7. Discuss with the class the outcomes of all the germination tests. The children write down which conditions were best for germination in their scientific notebooks and whether these conditions were the same for all seeds tested.
8. Children can transplant and grow on any germinated young plants. These can be kept to plant at school or at home.
9. Hand out 1 plastic pot per child.



10. Each child fills the pot with soil to a centimetre below the rim. Using tweezers they should gently cut the agar from around the young plant so the plant is left standing in a small cube of agar. Holding the cube gently to keep the roots intact, the children should place it into the pot adding a little compost to ensure that the plant roots and agar are under the compost level, taking care not to damage the tiny stem and any seed leaves.
11. Label pots, including the name of the species, date of seed collection and date of planting.

Teachers' notes

Take care with young plants because they are very delicate. When growing on the seedlings, it is very important to cut the agar cubes around the young plant to protect its roots because they are very fragile. If the roots are damaged the young plant can easily die. If there are enough plants, up to 5 seedlings can be transplanted into one pot. Children must place these young plants at an equal distance apart from one another, so as not to bind the roots of several plants together.

After transplanting many young plants will die. It's important that children understand that this is a natural process, and one that happens in the wild. For plants that are endangered or threatened in the wild, loss of seedlings can be a major problem.

If the children had access to incubators to carry out the germination experiments, they should understand that the transition from the sterile and consistent conditions inside an incubator to an outdoor planting area can be very disturbing for the plant. These plants are particularly susceptible to changes in humidity and to attack by pests and diseases.

After 1-2 months, if the plants have grown well, separate out individual plants into single pots and grow on.

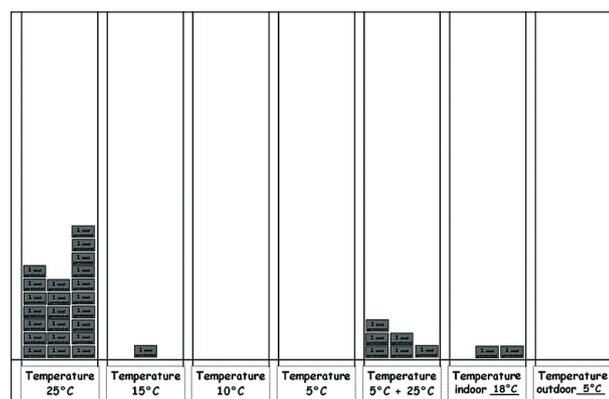
Health and Safety

Ensure that children are properly supervised when using tweezers.

Example 1: Seed germination tiles.

1 seed germinated	1 seed germinated	1 seed germinated
1 seed germinated	1 seed germinated	1 seed germinated
1 seed germinated	1 seed germinated	1 seed germinated

Example 2: Class results example.



Outcomes of germination experiments

Name	Date
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Put a cross in the boxes representing the conditions at which your seeds germinated best:

Fill in how many seeds germinated under each temperature range

	Temperature	light condition		Number of germinated seeds
		12 hrs light +	24 hrs dark	
Temperature	25°C			
	15°C			
	10°C			
	5°C			
	5°C + 25°C			
Temperature indoors (optional)				
Temperature outdoors (optional)				


 Today I learned