Objectives
- To know the conditions that seeds need to germinate.

Resources
Cress or mung beans (or other fast-germinating seeds); compost; eight small containers per group; sticky labels; photocopiable page 140 'Growing seeds'

Speaking scientifically
conclusion, fair test, observation, prediction, results

Lesson 1: Germination

Introduction
Remind the children of the investigations they have carried out in recent lessons, particularly looking at plants and light, and plants and water. Ask: *What do plants need to grow? Can anybody tell me what effect light has on plants? Why is water important to plants?* Address any misunderstandings that may become apparent as a result of your questions and ask other children to share and discuss their ideas.

Whole-class work
1. Tell the children that they are going to carry out an investigation to find the ideal conditions for germinating seeds. At this stage you may wish to clarify the difference between germination and growth. (Germination is the first stage, where the seed swells, splits and roots and shoots begin to emerge. Growth is the later stage, where leaves have formed and the plant begins to produce food for further development and growth.)

2. Ask the children what they think might be required for seeds to germinate. Encourage discussion of all the possible conditions and list these on the board. Ensure that at the very least your list contains light, water and a suitable temperature (heat).

3. As a class, begin to plan a fair test to investigate the germination of seeds with different amounts of light, heat and water.

4. Ask the children to work out how many different combinations there are and therefore how many samples they will need to grow. They will also need to consider the following: how much water they will give the plants and how often (for example daily, every three days, weekly); where to keep the plants needing light and those needing dark (for example in a store room, on a window sill); where to keep those that need heat or cold (for example in a cold store room, outside, in a fridge).

Group work
5. Provide the resources the children need, and distribute and talk through photocopiable page 140 'Growing seeds'.

6. The children can work in groups of three or four to set up their investigation. Remind them to put sticky labels with their own names, the plant number and the conditions (whether given water, light or warmth) on the pots.

7. The children can use the photocopiable sheets to help them observe and keep a record of what happens in their investigation over the next two weeks. The questions at the end should help them to reach a conclusion.

Science in the wider world
The success of plants is vitally important to humans, since we harvest and use a large range of fruits, vegetables, cereals and grains as food. Many different food crops are grown throughout the world and are a major part of the diets of most of the world's population. It is humankind's general success in growing crops that has allowed us to thrive throughout the world, despite problems in some countries.

Review
During the investigation, try to find time to talk to each child about it individually. Aim to gauge their level of understanding about what they are doing and why. The children's written work should also help to indicate their understanding. They should have been able to keep accurate records of their work, presenting their results and drawing some conclusions that show they understand that seeds that have water, light and heat will grow better. Some may also be able to suggest why.