Investigating the effect of minerals on plant growth

The purpose of this activity is:

* to develop the skills you need to plan and carry out a reliable scientific investigation
* to find out how different minerals affect plant growth
* to compare methods for estimating plant growth

### Procedure

SAFETY: Follow good hygiene practice if you handle any weed collected from ponds, or cultures of alga.

### Investigation

1. Discuss the different ways of estimating plant growth and describe in detail how you would set out your experiment. Identify your independent variable, any control variables and the dependent variable you will use as a final measure.
2. Set up your investigation.
3. After the plants have developed, record your observations of their growth.
4. Record any measurements you make of how much the plants have grown in each culture medium.

**QUESTIONS**

1. What steps have you taken to ensure that your results are reliable?
2. How are the plants affected by growth in the different culture media?
3. Which culture medium encouraged the greatest growth of plant material?
4. What does this suggest about how we should fertilise the soil in which we grow our food crops?

**ANSWERS**

1. Results will be reliable if there are several individuals included in the sample tested. Results will be valid if the variables are well controlled. Results will be accurate if careful measurements are made of quantitative variables.
2. In some mixtures, deficient in particular minerals, leaves are pale and plants do not thrive. In other mixtures, the roots do not grow well.
3. Plants grow best in a complete medium, containing all mineral salts.
4. If we are trying to improve soil fertility to maximise food crops, we need to make sure that all minerals are present in adequate quantities in the soil. Adding nitrate alone, or potassium alone will not fertilise the soil to ensure good root growth and healthy leaves.