

Teaching ideas for Chapter 9, *Plant science*

Many students have a limited background in plant science and often struggle with the structures and classification of plants. This topic is important preparation for those HL students who are studying Option G, *Ecology and conservation*. Plants in the laboratory or classroom provide a good starting point.

Practical activities

- Supply transverse sections of roots and stems so that students can compare their structures. Give direction in the difference between accurate drawings from the microscope and simple plan drawings that are required by the syllabus.
- Over an extended period of time, challenge students to grow the ‘bushiest’ house plant from a plant such as a fuchsia supplied at the start of term. Investigate the growth of bonsai trees and relate this to apical and lateral meristems.
- Experiment with a plant such as a bean and ask students to persuade the plant to grow through a maze by careful positioning of lights to demonstrate the effect of auxin and phototropism.
- Experiments with transpiration are best conducted during the summer months. Students can plan their own investigations for assessment if suitable plants are available. Alternatively data on transpiration can be provided for interpretation. The SAPS website provides useful instructions and data:
<http://www.saps.org.uk/secondary/teaching-resources/115-comparison-of-transpiration-rates>
- Students can use microscopes to investigate different types of pollen from a variety of plants. They can experiment with growing pollen in different concentrations of glucose solution and observe the results. SAPS have good suggestions for ‘forensic’ investigations using pollen (see, for example, <http://www.saps.org.uk/secondary/teaching-resources/137-pollen-and-other-airborne-particals>) and suggest the following species as abundant sources of pollen.
 - horse chestnut (*Aesculus hippocastanum*)
 - hollyhock (*Alcea rosea*)
 - courgette / marrow (*Cucurbita pepo*)
 - sunflower (*Helianthus annuus*)
 - Christmas rose (*Helleborus niger*)
 - hibiscus (*Hibiscus* sp.)
 - St John’s wort (*Hypericum* sp.)
 - evening primrose (*Oenothera biennis*)
- Provide plastic drink bottles and ask students to use them to investigate the conditions required for germination of small seeds such as cress in ‘mini greenhouses’ that they construct themselves.

Links to ICT

- Data loggers can be used to record temperature and light in transpiration experiments.
- NASA’s Goddard Institute for Space Studies (www.giss.nasa.gov) is a good source of data on climate change, which can be analysed in the context of plant science.

Aspects of internationalism

- Flowering times of similar species in different locations on Earth can be investigated to reinforce learning about the control of flowering in long-day and short-day plants.