# **SCIENCE learning springboards**

# Forces: working scientifically

### An experiment - the effect of wind on trees laden with ivy

Aim: Learn about the effect of the force of the wind on trees and to perform a fair test and present findings

Resources: twigs, wool, tray of sand or earth, hair dryer or fan

### Activity:

Which trees are most likely to fall in a gale?

Explore the grounds or locality to look at older deciduous trees that are full of ivy that has grown up the trunk, and into the upper branches too. Ivy is not a parasitic plant, but does climb up into a tree canopy. Take photographs of the ivy-laden trees.

- Why might tree owners be worried about extensive ivy growth?
- Why might extensive ivy growth be dangerous in high winds in Autumn or Winter when the tree has lost its leaves?

### Carry out an experment to see what happens.

- Collect small thin bare branches to represent winter trees with no leaves and place half of the 'trees' into a tray of earth or sand, close to a power outlet.
- For the other half of the 'trees', wrap lots of wool around their branches, then place these into another tray of earth to the same depth.
- Using a hair dryer or fan, on a high setting, try to blow both sets of trees over.
- Which trees show a better chance of standing up in the wind?

Document the results. Do any of the trees you photographed earlier look as if they could be affected by high winds in Autumn or Winter? What would the impact be in these trees fell? What could be done to reduce the risk?

### Success criteria: students can

- Explain the effects of ivy on a tree's resistance to high winds
- Set and record a fair test
- Analyse data
- Ø Draw conclusions

### Key vocabulary:

Force, Beaufort scale

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# Adaptations: evolution and inheritance

## Plants' adaptations to suit locality, soil and microclimate

**Aim:** Know how plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

### Activity:

Pupils list the ways plants adapt to their environment:

- Competing for water, minerals and nutrients
- Securing enough sunlight/space for photosynthesis
- Strategies for dispersal of seeds away from parent plant.

• Shape and structure, for example, low growing in mountains or shaped by the wind. Pupils explore their grounds (or gardens/houseplants, as homework) to see if they can find a range of plants demonstrating adaptations. They then research and document plants that demonstrate adaptation such as:

- small leaves, waxy skin and spines adaptations to cope with dry hot climate and very little water (desert) cacti and succulents
- drip tips, water runs off to discourage growth of bacteria and fungi in wet humid climates (jungle)
- Buttresses prop up plants in shallow soft soils (swamps)
- Climbing and epiphytic plants to reach sunlight (rain forests)
- Pond/wetland plants air pockets in the leaves to help them float, and floating seeds for dispersal.

Extension task - Refer to the work of Carl Linnaeus, a pioneer of classification

### More springboards

- Geography Learning Springboard: Navigation by Plants (buttress reference)
- Science Learning Springboard: Seed Dispersal
- Science Learning Springboard: Pinecone hygrometer

### Success criteria: students can:

- $\checkmark$  Use broad groupings to sort plants
- $\checkmark$  Understand a range of plant adaptations

### Key vocabulary:

Adaptation, buttress, epiphyte



