

SCIENCE learning springboards

Pappus

Living things and their habitats: dissection

Dissect a broad bean to reveal the structure of a seed

Aim: Identify the key parts of a broad bean and broad bean flowers and draw an annotated exploded diagram

If possible, grow your own broad beans in a pot or a patch of soil in the school grounds.

Resources: Sufficient broad bean seeds, soaked overnight – or harvested fresh directly from the school grounds if possible.

Activity

Give each pupil (or pair) a soaked bean and a sharp knife or scalpel* to find the following parts of the bean:

- Attachment scar (analogous to our own belly button)
- Brown skin-seedcoat (peel this away)
- The 'food store' that provides energy for germination before the plant's leaves open to photosynthesis
- An 'arrow shape', which is the beginning of the first root
- A crack along back of bean – prise this open
- Find a 'hook' structure – this is the shoot that will become the stem
- Separate the root and shoot from the food store. Is this the smallest plant you have ever seen?
- Draw an annotated exploded diagram to describe the seed's structure.

*Refer to your own risk benefit policy; a scalpel or sharp knife is important to get the most from this activity. If you cannot allow individual use of knives, then give the pupils their own beans to handle, but dissect one yourself using the visualiser.

More springboards:

- Maths - Data handling - broad bean (grown in a jar to observe its germination and measure its growth rate)
- Design Technology: Plant dissection (Dandelion and Dog Rose, using scalpels)

Success criteria: pupils can

- ✓ Use tools safely
- ✓ Follow instructions to identify parts of a seed/plant
- ✓ Carefully record my observations

Key vocabulary:

Root, shoot, food store

Life cycle of plants: pollination

Identify different reproductive parts of plants

Aim: Describe the life process of reproduction in specific plants, using the Pappus Plant ID sheets to identify the key parts of each plant.

Resources: Print the Pappus Plant ID sheets for bramble, horse chestnut, dog rose, willow, grasses and hazel; a range of flowers and grasses.

Activity:

Dissect or gently pull apart each flower to identify the individual parts of the plant.

- Compare the parts of the different flowers. What similarities and differences can be observed?
- Draw and label a diagram, describing the correct name and function of each part of the flower.

Activity 2

Examine the flowers and grasses to identify the features of each plant that identify them as either wind pollinated:

- panicles (flower head) lifts above the leaves, spreads and moves about in the wind
- plants tend to grow close together to exchange pollen in the breeze
- anthers (pollen bearing parts) are loose to facilitate wind-blown pollen – see the Pappus Plant ID sheets

or insect pollinated:

- showy flowers to attract insects
- fragrant flowers to attract insects

Some plants can use both strategies for pollination - a belt and braces approach!

More springboards:

- Research the coloured 'infrared' signals plants give to insects, for example the horse chestnut 'traffic lights'
- Use the Pappus Plant ID sheets to create classification charts.

Success criteria: pupils can

- ✓ Describe different types of reproduction, including sexual and asexual reproduction in plants
- ✓ Observe and compare the life cycles of plants
- ✓ Ask questions and suggest reasons for similarities and differences between plants.

Key vocabulary:

Panicle, anther, and see glossaries on plant fact sheets.

