

SCIENCE learning springboards

Pappus

Nettles as a soil indicator

Why do nettles grow *here* but not *there*?

Aim: Explore the different chemical properties of soils: nettles indicate soils high in phosphates and nitrogen.

Resources:

Soil test kits, plans of the school site

Activity:

Choose various points around the school grounds to set up an investigation for testing the pH and NPK levels of soils at various points around the school grounds.

- Chose an unmanaged area where nettles are growing vigorously and similar unmanaged places where nettles are not growing. This will help make a fair test because pupils will know the comparison areas have the same basic ecology.
- Plot these on a plan of the school site.
- Take soil samples and record and compare the readings at each location.
- What is the difference between the locations with and without nettles?
- What does this tell you about fertilisers for growing vegetables?

Link this activity to work on photosynthesis. Without nitrates, the amount of chlorophyll in leaves reduces, thus reducing plants' ability to photosynthesise.

More springboards:

- Science Learning Springboard: Leaf chromatography

Key vocabulary:

pH, NPK, nitrogen, phosphorous, potassium

Success criteria:

- ✓ I can plan and conduct an investigation and gather data to explain a hypothesis
- ✓ I understand and can explain different levels of soil types



Soil testing and soil fertiliser

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Symbiosis interdependence

Evidence of insects living on plants: galls

Aim: Gather evidence to show how many species live 'hidden' in plant galls - abnormal growths caused by irritation or stimulation of plant cells by insects using the plant as a host.

Resources:

The Pappus Plant ID sheets for oak, lime, willow, nettle and dog rose; muslin squares.

You may need to identify galls in advance or bring some into school.

The best time to find galls is in late summer; keep them ready for use in autumn lessons.

Activity:

Explore the school grounds looking for examples of galls.

Pupils could expect to find:

- Gall wasp: oak
- Sawfly: willow.
- Mites: lime
- Butterfly roll gall: nettle
- Robin's pincushion gall wasp: dog rose

Photograph the galls in situ and write a guide to galls in the grounds, explaining life cycles and habitats.

Ways to collect and observe:

- Photograph, and leave the gall and insects in place.
- Take cuttings with leaf galls; keeping the stem in a jar of water, covered with muslin.
- Robin's pincushion galls can be collected when they are pink in mid-summer and kept in containers with dry sand at the bottom (and muslin top) until the insects emerge.
- Galls found in school grounds can be investigated 'in situ' by covering them with muslin. Check regularly until the insects emerge.

Key vocabulary: gall, cell, symbiosis, interdependence

Success criteria:

- ✓ I can explain what a gall is and why it is formed
- ✓ I can describe the types of insects that live inside a gall

