



The Cranedale Centre has had extraordinary success in delivering the new biology specification 2015. Following this, additional activities have been developed and are outlined in this document. Whilst **Core Practical 10** forms the cornerstone of the fieldtrip, these additional activities aim to develop skills in the twelve Apparatus and Techniques required by each exam board. Each practical will last about an hour and can be undertaken as an evening activity or to complement a particular fieldwork day.



Microscopy of an Olive Mayfly Nymph

Using light microscopes at low power with graticules, students produce a scientific drawing to scale from observation of a live mayfly nymph and include annotations explaining its adaptations for gas exchange.

AT Skills referenced: **1** (use of appropriate apparatus), **4** (use of light microscope at low power with a graticule), **5** (produce a scientific drawing from observation with annotations) and **8** (safe and ethical use of organisms)

Mathematical Skills referenced: MS 1.8

Syllabus Links referenced:

Topic 4 (4.2) Understand the concept of niche and discuss examples of adaptation of organisms to their environment (behavioural, physiological, anatomical).



Owl Pellet Dissection

Students safely use instruments to dissect an owl pellet and produce a scientific drawing to scale and with annotations of the contents. Students will be able to show competency in the safe use of a range of instruments including mounted needles and pins to mount parts of the specimens. To conclude, students are trained in the use of the Chi² test to compare differences in Barn Owl diets between the Yorkshire Wolds and nearby Vale of Pickering.

AT Skills referenced: **1** (use of appropriate apparatus), **4** (use of light microscope at low power with a graticule), **5** (produce a scientific drawing from observation with annotations) and **9** (safely use Instruments for dissection)

Mathematical Skills referenced: MS 1.9

Syllabus Links referenced:

Topic 4 (4.2) Understand the concept of niche and discuss examples of adaptation of organisms to their environment (behavioural, physiological, anatomical).

Topic 4 (4.3) Understand how natural selection can lead to adaptation and evolution.



Chromatography of Seaweeds

Students use thin-layer chromatography to investigate the photo-pigments of red, brown and green seaweeds. Their results are then used as evidence by the students to answer challenging questions about the relatedness of seaweeds to terrestrial plants and suggest possible patterns of seaweed distribution with relation to light availability at depth within the intertidal zone.

AT Skills referenced: 1 (use appropriate apparatus), 3 (use laboratory glassware), 7 (separate biological compounds using thin layer chromatography)

Mathematical Skills referenced: MS 0.3, MS 2.4

Syllabus Links Referenced:

Topic 4: Understand the concept of niche and be able to discuss examples of adaptation of organisms to their environment (behavioural, physiological and anatomical).

Topic 4: Understand how natural selection can lead to adaptation and evolution

Topic 4: Understand that classification is a means of organising the variety of life based on relationships between organisms using differences and similarities in phenotypes and in genotypes, and is built around the species concept.

Topic 4: Understand the process and importance of critical evaluation of new data by the scientific community, which leads to new taxonomic groupings, including the three domains of life based on molecular phylogeny, which are Bacteria, Archaea, Eukaryota.



Choice Chamber Experiment with Freshwater Shrimp (Core Practical 18)

Students will investigate the effect of an environmental variable such as light levels or substrate material on the movement of shrimp, Gammarus pulex, using a choice chamber. To conclude, students will process their data using an iPad and will be trained in the use of the Chi² test.

AT Skills referenced: 1 (use of appropriate apparatus), 8 (safe and ethical use of organisms), and 12 (use ICT software to process data)

Mathematical Skills referenced: MS 1.9

Syllabus Links referenced:

Topic 8.2 i: Understand how the nervous systems of organisms can cause effectors to respond to a stimulus.

Topic 8.13: Understand how animals, including humans, can learn by habituation.

Core Practical 1 ii: Be able to discuss the potential ethical issues regarding the use of invertebrates in research.

Core Practical 18: Be able to investigate habituation to a stimulus.