



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 **Practical Activity Group 3** 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 (Practical Activity Group 1)

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: **a** (use of appropriate apparatus), **d** (use of light microscope at low power with a graticule), **e** (produce a scientific drawing from observation with annotations) and **h** (safe and ethical use of organisms)

Mathematical Skills referenced: MS 1.8

Syllabus Links referenced:

3.1.1 (f) Mechanisms of ventilation and gas exchange in bony fish and insects

4.2.2 (g) Adaptations of organisms to their environment



Owl Pellet Dissection (Practical Activity Group 2)

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: **a** (use of appropriate apparatus), **d** (use of light microscope at low power with a graticule), **e** (produce a scientific drawing from observation with annotations) and **j** (safely use Instruments for dissection)

Mathematical Skills referenced: MS 1.9

Syllabus Links referenced:

3.1.3 (e i) behavioural, physical and anatomical adaptations to the environment

4.2.2 (g) Adaptations of organisms to their environment

6.3.2 (a) Factors that determine the size of a population to include limiting factors and carrying capacity

6.3.2 (b) interactions between populations to include interspecific and intraspecific competition, predator-prey

6.3.1 (e) Distribution and abundance of organisms



Chromatography of Seaweeds (Practical Activity Group 6)

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: a (use appropriate apparatus), c (use laboratory glassware), g (separate biological compounds using thin layer chromatography)

Mathematical Skills referenced: MS 0.3, MS 2.4

Syllabus Links Referenced:

4. The relationships between organisms are studied, considering variation, evolution and phylogeny.

5.2.1 Photosynthesis (c) (i) the importance of photosynthetic pigments in photosynthesis

(ii) practical investigations using thin layer chromatography to separate photosynthetic pigments

5.2.1 (s) (i) the principles and uses of paper and thin layer chromatography to separate biological molecules/compounds; to include calculation of R_f values

(ii) Practical investigations to analyse biological solutions using paper or thin layer chromatography.



Choice Chamber Experiment with Freshwater Shrimp (Practical Activity Group 11)

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: a (use of appropriate apparatus), h (safe and ethical use of organisms), and I (use ICT software to process data)

Mathematical Skills referenced: MS 1.9

Syllabus Links referenced:

5.1.5 In animals, responding to changes in the environment is a complex and continuous process, involving nervous, hormonal and muscular coordination.