



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 **Required Practical 12** 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.



Chromatography of Seaweeds (Required Practical 7)

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:

Topic 4 (4): Students should be able to show an understanding that adaptation and selection are major factors in evolution and contribute to the diversity of living organisms

Topic 4 (5): A phylogenetic classification system attempts to arrange species into groups based on their evolutionary origins and relationships.

Topic 5: In photosynthesis, light is absorbed by chlorophyll

Topic 5: The process of photosynthesis is common in all photoautotrophic organisms and the process of respiration is common in all organisms, providing indirect evidence for evolution.

Topic 5 (1): Students should be able to identify environmental factors that limit the rate of photosynthesis

Topic 7 (3): explain how evolutionary change over a long period of time has resulted in a great diversity of species



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: 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:

Topic 3 (2): Adaptations for gas exchange in insects (trachea, tracheoles and spiracles)

Topic 4 (4): Adaptation (anatomical, physiological and behavioural), evolution



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: 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:

Topic 4 (4): Natural selection results in species that are better adapted to their environment. Adaptation (anatomical, physiological and behavioural), evolution

Topic 4 (4): Show understanding that adaptation and selection are major factors in evolution and contribute to the diversity of living organisms.

Topic 7 (4): An ecosystem supports a certain size of population of a species, called the carrying capacity. This population size can vary as a result of: the effect of abiotic factors; interactions between organisms: interspecific and intraspecific competition and predation.



Choice Chamber Experiment with Freshwater Shrimp (Required Practical 10)

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 l (use ICT software to process data)

Mathematical Skills referenced: MS 1.9

Syllabus Links referenced:

Topic 6 (1): Organisms increase their chance of survival by responding the changes in their environment.

Topic 6 (1): Taxes and kineses as simple responses that can maintain a mobile organism in a favourable