**Mandatory experiments**

**First Year Biology**

OB3 Qualitative food tests for starch, reducing sugar, protein and fat.

OB5 Investigate the conversion of chemical energy in food to heat energy.

OB8 Investigate the action of amylase on starch; identify the substrate, product and enzyme.

OB39Investigate the variety of living things by direct observation of animals and plants in their environment; classify living organisms as plants or animals, and animals as vertebrates or invertebrates.

OB44 Prepare a slide from plant tissue and sketch the cells under magnification.

**First Year Chemistry**

OC2 Separate mixtures using a variety of techniques: filtration, evaporation, distillation and paper chromatography.

OC17 Grow crystals using alum or copper sulphate.

OC19 Investigate the pH of a variety of materials using the pH scale

OC22 Show that approximately one fifth of the air is oxygen; show that there is CO2 and water vapour in air.

OC24 Prepare a sample of oxygen by decomposing H2O2 using MnO2  as a catalyst.

**First Year Physics**

OP20 Identify different forms of energy and carry out simple experiments to show the following energy conversions:

(a) chemical to electrical to heat energy (b) electrical to magnetic to kinetic energy (c) light to electric to kinetic energy.

OP34Show that light travels in straight lines.

OP38 Investigate the reflection of light by plane mirrors, and illustrate this using ray diagrams; demonstrate and explain the operation of a simple periscope.

OP46 Plot the magnetic field of a bar magnet

**Second Year Biology**

OB11 Carry out qualitative tests to compare the carbon dioxide levels of inhaled and exhaled air.

OB59 Study a local habitat, using appropriate instruments and simple keys to show the variety and distribution of named organisms.

OB65 Investigate the presence of micro-organisms in air and soil.

**Second Year Chemistry**

OC27 Prepare carbon dioxide and show that it does not support combustion.

OC30 Conduct a qualitative experiment to detect the presence of dissolved solids in water samples, and test water for hardness (soap test).

**Second Year Physics**

OP23 Investigate and describe the expansion of solids, liquids and gases when heated, and contraction when cooled.

OP31 Carry out simple experiments to show the transfer of heat energy by conduction, convection and radiation; investigate conduction and convection in water.

OP2 Measure the mass and volume of a variety of solids and liquids and hence determine their densities.

OP6 Investigate the relationship between the extension of a spring and the applied force.

**Third Year Biology**

OB49 Show that starch is produced by a photo-synthesising plant.

OB58 Investigate the conditions necessary for germination

**Third Year Chemistry**

OC38 Titrate HCl against NaOH, and prepare a sample of NaCl.

OC46 Carry out an experiment to demonstrate that oxygen and water are necessary for rusting.

OC51 Investigate the reaction between zinc and HCl, and test for hydrogen.

**Third Year Physics**

OP49 Test electrical conduction in a variety of materials, and classify each material as a conductor or insulator.

OP50 Set up a simple electric circuit; use appropriate instruments to measure current, potential difference (voltage) and resistance, and establish the relationship between them.