

Appendix 6: Suggested practical investigations

The following suggestions are *additional* practical investigations that exemplify the scientific process. They can be used to supplement students' understanding of biology, chemistry and physics in addition to the practical investigations found in the main body of the content.

Biology

- Investigate human responses to external stimuli.
- Investigate reaction times.
- Investigate the effect of pollutants on plant germination and plant growth.
- Investigate inheritance using suitable organisms or models.
- Investigate the presence of glucose in simulated urine/body fluids.
- Investigate the effect of exercise on heart rate.
- Investigate the relationship between organisms and their environment using fieldwork techniques.
- Investigate the distribution of organisms in an ecosystem, using sampling techniques including:
 - pooters
 - sweep nets/pond nets
 - pitfall traps and measure environmental factors including:
 - temperature
 - light intensity
 - pH.
- Investigate plant and animal cells with a light microscope.
- Investigate the effect of glucose concentration on rate of anaerobic respiration in yeast.
- Investigate the effect of different factors on bread making.
- Investigate the use of enzymes in washing powders.
- Investigate temperature loss in beakers of hot water of different sizes.

Chemistry

- Investigate the ease of thermal decomposition of carbonates, including calcium carbonate, zinc carbonate and copper carbonate.
- Compare the temperature rise produced when the same volume of water is heated by different fuels.
- Investigate the volume of air used up and products formed when candles are burned.
- Carry out simple neutralisation reactions of acids, using metal oxides, hydroxides and/or carbonates.
- Investigate the rusting of iron.
- Investigate simple oxidation and reduction reactions, such as burning elements in oxygen or competition reactions between metals and metal oxides.
- Investigate the fractional distillation of synthetic crude oil and the ease of ignition and viscosity of the fractions.
- Investigate the products produced from the complete combustion of a hydrocarbon.
- Investigate the properties of a group of elements, e.g. Group 2.
- Investigate the properties of typical ionic compounds.
- Carry out a series of ion tests to identify unknown compounds.
- Build models of simple covalent molecules.
- Investigate the typical properties of simple and giant covalent compounds.
- Investigate the rate of reactions, such as magnesium and hydrochloric acid; or sodium thiosulfate and hydrochloric acid.

Physics

- Investigate the power consumption of low-voltage electrical items.
- Investigate models to show refraction, such as toy cars travelling into a region of sand.
- Investigate the areas beyond the visible spectrum, such as those found by Herschel and Ritter, who discovered infrared and ultraviolet (UV) respectively.
- Investigate the relationship between potential difference (voltage), current and resistance.
- Investigate the relationship between force, mass and acceleration.
- Investigate the forces required to slide blocks along different surfaces, with differing amounts of friction.
- Investigate how crumple zones can be used to reduce the forces in collisions.
- Investigate power by running up the stairs or lifting objects of different weights.
- Investigate the critical angle for Perspex[®]/air, glass/air or water/air boundaries.
- Investigate factors affecting the height of rebound of bouncing balls.
- Investigate the temperature and volume relationship for a gas.
- Investigate the volume and pressure relationship for a gas.
- Investigate the absorption of light by translucent materials in order to simulate the absorption of rays.

Safety is an overriding requirement for all practical work. Centres are responsible for ensuring that whenever their students complete practical work appropriate safety procedures are followed.