**Number of doubles for mandatory experiments**

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|  | **Biology** | **Year** |  |  |  | **Chemistry** | **Year** |  |  |  | **Physics** | **Year** |  |
| OB3 | Qualitative food tests for starch, reducing sugar, protein and fat. | 1 | 2D | OC2 | Separate mixtures using a variety of techniques: filtration, evaporation, distillation and paper chromatography. | 1 | 2D | 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. | 1 | 1D |
| OB5 | Investigate the conversion of chemical  energy in food to heat energy. | 1 | 1D | OC17 | Grow crystals using alum or copper sulphate. | 1 | 1D | OP34 | Show that light travels in straight lines. | 1 | 1D |
| OB8 | Investigate the action of amylase on starch;  identify the substrate, product and enzyme. | 1 | 1D | OC19 | Investigate the pH of a variety of materials using the pH scale | 1 | 1D | OP38 | Investigate the reflection of light by plane mirrors, and illustrate this using ray diagrams; demonstrate and explain the operation of a simple periscope. | 1 | 2D |
| OB39 | Investigate 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. | 1 | 1D | OC22 | Show that approximately one fifth of the air is oxygen; show that there is CO2 and water vapour in air. | 1 | 1D | OP46 | Plot the magnetic field of a bar magnet. | 1 | 1D |
| OB44 | Prepare a slide from plant tissue and sketch the cells under magnification. | 1 | 2D | OC24 | Prepare a sample of oxygen by decomposing  H2O2 using MnO2  as a catalyst. | 1 | 1D | OP23 | Investigate and describe the expansion of solids, liquids and gases when heated, and contraction when cooled. | 2 | 2D |
| OB11 | Carry out qualitative tests to compare the carbon dioxide levels of inhaled and exhaled air. | 2 | 1D | OC27 | Prepare carbon dioxide and show that it does not support combustion. | 2 | 1D | OP31 | Carry out simple experiments to show the transfer of heat energy by conduction, convection and radiation; investigate conduction and convection in water. | 2 | 3D |
| OB59 | Study a local habitat, using appropriate  Instruments and simple keys to show the variety and distribution of named organisms. | 2 | 2D | OC30 | Conduct a qualitative experiment to detect the presence of dissolved solids in water samples, and test water for hardness (soap test). | 2 | 2D | OP2 | Measure the mass and volume of a variety of solids and liquids and hence determine their densities. | 2 | 2D |
| OB65 | Investigate the presence of micro-organisms in air and soil. | 2 | 1D | OC38 | Titrate HCl against NaOH, and prepare a sample of NaCl. | 3 | 1D | OP6 | Investigate the relationship between the extension of a spring and the applied force. | 2 | 1D |
| OB49 | Show that starch is produced by a  Photo-synthesising plant. | 3 | 1D | OC46 | Carry out an experiment to demonstrate that oxygen and water are necessary for rusting. | 3 | 1D | OP49 | Test electrical conduction in a variety of materials, and classify each material as a conductor or insulator. | 3 | 1D |
| OB58 | Investigate the conditions necessary  for germination | 3 | 1D | OC51 | Investigate the reaction between zinc and HCl, and test for hydrogen. | 3 | 1D | OP50 | Set up a simple electric circuit; use appropriate instruments to measure current, potential difference (voltage) and resistance, and establish the relationship between them. | 3 | 1D |