**Biology required practicals**

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| **Topic** | **Title** | **What to do** | **Video link** |
| B1.2 | Using a light microscope | Use a light microscope to observe, draw, and label a selection of plant and animal cells and include a scaled magnification. | <https://www.youtube.com/watch?v=SX6mow1AExI> |
| B1.8 | Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. | Investigate osmosis by measuring how the mass of plant tissue changes in a range of concentrations of salt or sugar solutions. | <https://www.youtube.com/watch?v=aA_UvVeQbww> |
| B3.3 | Use standard food tests to identify food groups. | Detect sugars, starch, and proteins in food using Benedict's test, the iodine test, and Biuret reagent. | <https://www.youtube.com/watch?v=mLAwvMLjmAs> |
| B3.6 | Investigate the effect of pH on the rate of reaction of amylase enzyme. | Students should use a continuous sampling technique to determine the time taken to completely digest a starch solution at a range of pH values. | <https://www.youtube.com/watch?v=8Yqbu56ImXk> |
| B5.4  *Triple only* | Investigating the effect of antiseptics or antibiotics on bacterial growth. | Use agar plates and measure the zones of inhibition produced around colonies. | <https://www.youtube.com/watch?v=Fd44VxSH2O8> |
| B8.2 | Investigate the effect of light intensity on the rate of photosynthesis | Use an aquatic plant to observe the effect light intensity has on the rate of photosynthesis. | <https://www.youtube.com/watch?v=cBCKedXdFeE> |
| B10.2 | Investigate the effect of a factor on human reaction time. | Plan and carry out an investigation, choosing appropriate ways to measure reaction time and considering the risks and ethics of the investigation. | <https://www.youtube.com/watch?v=81lPJtAp5Sc> |
| B11.19  *Triple only* | Investigate the effect of light or gravity on the growth of newly germinated seedlings. | Record results both as length measurements and as accurate, labelled biological drawings to show the effects. | <https://www.youtube.com/watch?v=8kTJJjlpedM> |
| B16.3 | Measure the population size of a common species in a habitat. | Use sampling techniques to investigate the effect of a factor on the distribution of this species. | <https://www.youtube.com/watch?v=pYGBgPSc8WI>  <https://www.youtube.com/watch?v=KlC-qPpQEgA> |
| B17.4  *Triple only* | Investigate the effect of temperature on the rate of decay of fresh milk. | Measure the pH change of milk to investigate how temperature affects its rate of decay. | <https://www.youtube.com/watch?v=7SXSzY1WLqQ> |

**Physics required practicals**

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| **Topic** | **Title** | **What to do** | **Video link** |
| P2.1 | Investigating thermal insulators | Use different materials and different thicknesses of the same material to insulate identical beakers of hot water, and measure the change in temperature of the water at regular intervals. | <https://www.youtube.com/watch?v=RZfSA2Xa6SU> |
| P2.4 | Determining specific heat capacity | Determine the specific heat capacity of a metal block of know mass by measuring the energy transferred to the block and its temperature rise, and using the equation for specific heat capacity. | <https://www.youtube.com/watch?v=Hiy8AM8l2n4> |
| P4.3  P4.6 | Investigating resistance | Set up circuits and investigate the resistance of a wire, and of resistors in series and parallel. | <https://www.youtube.com/watch?v=m_3JrA-sDEg>  <https://www.youtube.com/watch?v=51mSWRfAsAw> |
| P4.4 | Investigating electrical components | Correctly assemble a circuit and investigate the potential difference-current characteristics of circuit components. | <https://www.youtube.com/watch?v=1QtI15E-GMU> |
| P6.1 | Calculating densities | Measure the mass and volume of objects and liquids and calculate their densities using the density equation. | <https://www.youtube.com/watch?v=F7uto-YfSRc>  <https://www.youtube.com/watch?v=lh4W-cXcsBQ>  <https://www.youtube.com/watch?v=Ypg6mRbEhWs> |
| P10.1 | Investigate the relationship between force and acceleration. | Using a newton-metre, investigate the effect on the acceleration of an object of varying the force on it and of varying its mass. | <https://www.youtube.com/watch?v=ugzjeggjznw> |
| P10.8 | Investigate the relationship between force and extension for a spring. | Hang weights of known mass from a spring and, using the correct apparatus, measure the resulting extension. Use the results to plot a force-extension graph. | <https://www.youtube.com/watch?v=QQCJeAqBumE> |
| P12.4 | Investigating plane waves in a ripple tank and waves in a solid. | Determine which apparatus are the most suitable for measuring the frequency, speed, and wavelength of waves in a ripple tank, and investigate waves on a stretched string. | <https://www.youtube.com/watch?v=-gr7KmTOrx0>  <https://www.youtube.com/watch?v=55z1xL_CBb8> |
| P13.2 | Investigating infrared radiation. | Determine how the properties of a surface affect the amount of infrared radiation absorbed or radiated by  the surface. | <https://www.youtube.com/watch?v=oTgHAI_g6WY> |
| P14.2  *Triple only* | Investigate the reflection and refraction of light. | Use different substances and surfaces to investigate the refraction and reflection of light. | <https://www.youtube.com/watch?v=u3d0sRlPBow> |

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|  | **Chemistry required practicals**   |  |  |  |  | | --- | --- | --- | --- | | **Topic** | **Title** | **What to do** | **Video link** | | C4.7  *Triple only* | Use titration to investigate reacting volumes. | Use titration to find out how much of an acid is needed to completely react with an alkali. | <https://www.youtube.com/watch?v=8yHYoENtCEY> | | C5.5  C5.6 | Prepare a salt from an insoluble metal carbonate or oxide. | Prepare with the appropriate apparatus and techniques, a pure, dry sample of a soluble salt from an insoluble carbonate or oxide. | <https://www.youtube.com/watch?v=qIOMlwBoe_4> | | C6.4 | Investigate the electrolysis of a solution. | Investigate the electrolysis of different aqueous solutions using inert electrodes. | <https://www.youtube.com/watch?v=tCHE_7QeRUc> | | C7.1 | Investigating temperature changes. | Use appropriate apparatus to investigate the variables that affect energy changes in reactions involving at least one solution. | <https://www.youtube.com/watch?v=tKxcQYZ2YH8> | | C8.4 | Investigating the effect of concentration on rate of reaction. | Investigate how changes in concentration affect rates of reactions using a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. | <https://www.youtube.com/watch?v=WlitM81qGqE> | | C12.2 | Calculate Rf values. | Use paper chromatography to find out the Rf values of the dyes found in different food colourings. | <https://www.youtube.com/watch?v=pnTGNAfu6GE> | | C12.5  *Triple only* | Use chemical tests to identify unknown compounds. | Use a range of chemical tests to identify negative and positive ions in ionic compounds. | <https://www.youtube.com/watch?v=2vCU9pVAyVE> | | C14.2 | Purify and test water | Analyse and purify water from different sources, including pH, dissolved solids and distillation. | <https://www.youtube.com/watch?v=Ea3PH_q3kus> | |  |