

AQA Combined/Separate Science Required Practicals

Statement from AQA:

Practical work is at the heart of science, so we have placed it at the heart of this specification.

There are three interconnected, but separate reasons for doing practical work in schools.

They are:

1. To support and consolidate scientific concepts (knowledge and understanding). This is done by applying and developing what is known and understood of abstract ideas and models. Through practical work we are able to make sense of new information and observations, and provide insights into the development of scientific thinking.
2. To develop investigative skills. These transferable skills include:
 - devising and investigating testable questions
 - identifying and controlling variables
 - analysing, interpreting and evaluating data.
3. To build and master practical skills such as:
 - using specialist equipment to take measurements
 - handling and manipulating equipment with confidence and fluency
 - recognising hazards and planning how to minimise risk.

By focusing on the reasons for carrying out a particular practical, teachers will help their students understand the subject better, to develop the skills of a scientist and to master the manipulative skills required for further study or jobs in STEM subjects. Questions in the written exams will draw on the knowledge and understanding students have gained by carrying out the practical activities listed below. These questions will count for at least 15% of the overall marks for the qualification. Many of our questions will also focus on investigative skills and how well students can apply what they know to practical situations often in novel contexts.

Below is the list of all the required practicals that are needed for the AQA science GCSES.

As you watch each video, use the sheet attached to summarise the key apparatus used, the techniques and how the practical was carried out. Be sure to use diagrams and words to reinforce memory.

Biology

Microscopy - Use a light microscope to observe, draw and label biological specimens.	https://www.youtube.com/watch?v=jBVxo5T-ZQM
Osmosis - Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.	https://www.youtube.com/watch?v=ef2Ts2AKhq8
Enzymes - Investigate the effect of pH on the rate of reaction of amylase enzyme.	https://www.youtube.com/watch?v=JyXXoewEWc8
Food tests - Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars, iodine test for starch and Biuret reagent for protein.	https://www.youtube.com/watch?v=zbZxFxXN6m4
Photosynthesis - Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.	https://www.youtube.com/watch?v=cBCKedXdFeE
Reaction time - Plan and carry out an investigation into the effect of a factor on human reaction time.	https://www.youtube.com/watch?v=Fm02i4vEi5Q
Field investigations - 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=yLHz2Ea10Mg
<i>Plant responses (Biol only)</i> <i>Investigate the effect of light or gravity on the growth of newly germinated seedlings</i>	https://www.youtube.com/watch?v=fEo21LbnJJM
<i>Decay (Biol only)</i> <i>Investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change.</i>	https://www.youtube.com/watch?v=LeH5FUKSPzU

Chemistry

Making salts - Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.	https://www.youtube.com/watch?v=9GH95172Js8
Temperature changes - Investigate the variables that affect temperature change in chemical reactions eg acid plus alkali.	https://www.youtube.com/watch?v=rdI7xEq4Ew8
Rates of reaction - Investigate how changes in concentration affect the rates of reactions by both measuring the volume of a gas produced and monitoring a change in colour or turbidity.	https://www.youtube.com/watch?v=Fm02i4vEi5Q&t=6s
Chromatography - Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R _f values.	https://www.youtube.com/watch?v=P8i4QYncQxl
Water purification - Analysis and purification of water samples from different sources. To include pH measurement, removal of dissolved solids and distillation.	https://www.youtube.com/watch?v=DikcEq2wg8g
Electrolysis - Investigate what happens when aqueous solutions are electrolysed using inert electrodes.	https://www.youtube.com/watch?v=ukbtTTG1Kew
<i>Neutralisation (Chem only) - Determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.</i>	https://www.youtube.com/watch?v=saRBT5oZfh8
<i>Identifying ions (Chem only) - Use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from Flame tests and sulphates.</i>	https://www.youtube.com/watch?v=4iZRs4XIJOE

Physics

Specific heat capacity – An investigation to determine the specific heat capacity of one or more materials.	https://www.youtube.com/watch?v=HAPmwu7byGM
Resistance - Use circuit diagrams to set up and check appropriate circuits to investigate the factors that affect the resistance of an electrical circuit.	https://www.youtube.com/watch?v=YsZeZotYVag
I-V characteristics - Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements including a filament lamp, a resistor and a diode at constant temperature.	https://www.youtube.com/watch?v=A1SyKvdHoqY
Density - Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids.	https://www.youtube.com/watch?v=ScXOp8Zph28
Force and extension - Investigate the relationship between force and extension of a spring.	https://www.youtube.com/watch?v=jQAt3e6Bz7U
Acceleration – Investigate: <ul style="list-style-type: none"> • the effect of varying the force on the acceleration of an object of constant mass • the effect of varying the mass of an object on the acceleration produced by a constant force. 	https://www.youtube.com/watch?v=wl-VkxEelxw
Waves - Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves <ul style="list-style-type: none"> • in a ripple tank • in a solid. 	https://www.youtube.com/watch?v=UNmv6H-f180
<i>Radiation and absorption (Physics only) - Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.</i>	https://www.youtube.com/watch?v=eE7OPL7pesA
<i>Thermal insulation (Physics only) - Investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.</i>	https://www.youtube.com/watch?v=ILH45loyPUA
<i>Light (Physics only) - Investigate the reflection of light by different types of surface and the refraction of light by different substances.</i>	https://www.youtube.com/watch?v=2fN_jvf4fw8

Experiment on a page!

Title of investigation: _____

Results

IV:

DV:

Control variables:

Method:

Diagram of equipment:

Evaluation: