

A Level Biology: Practical skills

The apparatus and techniques (ATs) for Biology listed below are common to all exam boards. A Level biology students are required to gain experience using the named apparatus and developing and demonstrating **all** the techniques stated.

The 12 required practical activities specific to AQA provide opportunities for each of the expected ATs. Throughout the A Level course your teachers will also provide additional opportunities for practical skills development.

Biology Apparatus and Techniques (ATs)	
AT a	Use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH).
AT b	Use appropriate instrumentation to record quantitative measurements, such as a colorimeter or photometer.
AT c	Use laboratory glassware apparatus for a variety of experimental techniques to include serial dilutions.
AT d	Use of light microscope at high power and low power, including use of a graticule.
AT e	Produce scientific drawing from observation with annotations.
AT f	Use qualitative reagents to identify biological molecules.
AT g	Separate biological compounds using thin layer/paper chromatography or electrophoresis.
AT h	Safely and ethically use organisms to measure: <ul style="list-style-type: none">• plant or animal responses• physiological functions.
AT i	Use microbiological aseptic techniques, including the use of agar plates and broth.
AT j	Safely use instruments for dissection of an animal organ, or plant organ.
AT k	Use sampling techniques in fieldwork.
AT l	Use ICT such as computer modelling, or data logger to collect data, or use software to process data.

The teacher assessment will result in a 'pass' or 'fail' for practical endorsement in addition to your grade from the final written exams. You will also be assessed on your practical understanding throughout all three written exam papers.

Full details for the AQA practical assessment in Biology, including the Common Practical Assessment Criteria (CPAC) issued jointly by all awarding organisations can be viewed at

<https://www.aqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/a-level-practical-assessment>

An AQA practical skills 'handbook' is also available that might be a useful reference tool.

<https://filestore.aqa.org.uk/resources/biology/AQA-7401-7402-PHBK.PDF>

Required Practical Activity (x12)	Apparatus and technique ref.
1. Investigation into the effect of a named variable on the rate of an enzyme-controlled reaction	a, b, c, f, l
2. Preparation of stained squashes of cells from plant root tips; set-up and use of an optical microscope to identify the stages of mitosis in these stained squashes and calculation of a mitotic index	d, e, f
3. Production of a dilution series of a solute to produce a calibration curve with which to identify the water potential of plant tissue	c, h, j, l
4. Investigation into the effect of a named variable on the permeability of cell-surface membranes	a, b, c, j, l
5. Dissection of animal or plant gas exchange or mass transport system or of organ within such a system	e, h, j
6. Use of aseptic techniques to investigate the effect of antimicrobial substances on microbial growth	c, i
7. Use of chromatography to investigate the pigments isolated from leaves of different plants, e.g. leaves from shade-tolerant and shade-intolerant plants or leaves of different colours	b, c, g
8. Investigation into the effect of a named factor on the rate of dehydrogenase activity in extracts of chloroplasts	a, b, c
9. Investigation into the effect of a named variable on the rate of respiration of cultures of single-celled organisms	a, b, c, i
10. Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze	h
11. Production of a dilution series of a glucose solution and use of colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown 'urine' sample	b, c, f
12. Investigation into the effect of a named environmental factor on the distribution of a given species	a, b, h, k, l

The following link to 'physics and maths tutor' website has notes, videos and practice exam questions on each of the AQA required practicals.

<https://www.physicsandmathstutor.com/biology-revision/a-level-aqa/practical-skills/>