IQM3011

LEVEL 3 · CONTROLLED STAFF DOCUMENT

INTO QUALIFICATIONS

Biology

Assessment 1: Reflective/lab log portfolio

STAFF ONLY · Staff AO2/AO3 holistic rubric and guidance

Portfolio size
Approximately 2,000 words equivalent

Total marks
100

Assessment window
Sample assessment

Assessment set
Sample 2026

Audience
Staff only

Release timing
at portfolio release

STAFF ONLY · Award one best-fit raw percentage /100 for the complete log. Teacher observation is evidence within the holistic judgement and must not be separately weighted.

Apply AO2 and AO3 together to identify the overall best-fit band and raw percentage for the complete log. Teacher observation is supporting evidence and is not separately weighted.

Performance level	Mark range / anchors	AO2 · Application, practice and data **Holistic** Applies biology knowledge in practical contexts; plans and conducts work safely; records, processes and interprets data; identifies error and justifies improvements.	AO3 · Analysis, evaluation and reflection **Holistic** Explains and applies biology principles; interprets experimental evidence; relates theory to context; makes supported judgements; communicates procedures, results and conclusions clearly and accurately.
A*	**80-100**	• Apply comprehensive biology knowledge with exceptional precision and independence in unfamiliar practical contexts; design and conduct work judiciously and safely; process and interpret complex data accurately; evaluate uncertainty and justify well-targeted improvements.	• Integrate fundamental biology principles with experimental evidence to produce perceptive, well-supported interpretations and judgements; evaluate alternative explanations and limitations; communicate procedures, results and conclusions with exceptional clarity and precision.
A	**70-79**	• Apply thorough and comprehensive biology knowledge consistently in practical contexts; plan and conduct work judiciously and safely; record, process and interpret data accurately; identify error and justify improvements.	• Precisely explain and apply fundamental biology principles; interpret experimental evidence, relate theory to context, make well-supported judgements and communicate procedures, results and conclusions clearly and accurately.
B	**60-69**	• Apply a wide and deep knowledge of biology with competence and precision; plan and conduct practical work safely; record, process and interpret data accurately to reach informed conclusions.	• Explain and apply biology principles; draw inferences and predict outcomes from data; relate theory to real situations and communicate practical procedures, results and conclusions reliably using accurate terminology.
C	**50-59**	• Apply knowledge clearly in familiar practical contexts; use appropriate biological laboratory equipment and methods competently; maintain appropriate conditions and record, process and interpret data to draw conclusions.	• Draw valid inferences from data, relate biology concepts to some applications and explain complex ideas clearly using generally accurate scientific terminology.
D	**40-49**	• Attempt to apply knowledge in practical contexts; use equipment safely, manage conditions and usually record, process and interpret data to inform possible conclusions.	• Attempt reasonable inferences from data and links to real applications; explain some complex ideas and sometimes use appropriate scientific terminology.
E	**30-39**	• Show some practical knowledge and apply it with guidance; work safely and sometimes record, process and interpret data.	• Show awareness of possible interpretations of data; attempt to explain some processes and concepts and use some appropriate scientific terminology.
U	**0-29**	• Show insufficient evidence of safe, meaningful practical application or data handling.	• Show only limited awareness of biology concepts, evidence and scientific processes, with insufficient analysis or evaluation for a pass.

Application guidance

- Phones, tablets and smart watches are not permitted during the assessed laboratory-log activities.
- Credit accurately recorded observations and data even where an experimental outcome differs from an expected value, unless the record itself is inaccurate or fabricated.
- Use the practical-bank version and teacher-observation evidence to distinguish method execution from data recording, processing, analysis and evaluation.
- Credit valid alternative scientific approaches that meet the approved practical and assessment objectives.

Applying the portfolio judgement

Apply the full seven-band rubric to the complete portfolio. Select the best-fitting band from the sustained quality of practical application, data handling, analysis, evaluation and reflection. Record the evidence for AO2 and AO3 separately against the relevant descriptors, then justify one combined portfolio mark; do not infer one objective from evidence for the other or invent separate objective weightings. Use the descriptors and holistic best-fit judgement in the controlled rubric; do not introduce numerical subranges within a band.

Use dated teacher observations to corroborate performance, independence and support. Distinguish absence of recorded evidence from evidence of weak performance. Record any authenticity or missing-evidence issue through the centre process; do not fabricate a result or invent an automatic mark cap.

Assess the learner’s actual evidence. Unexpected or inconclusive results can support strong analysis when recorded honestly and evaluated well. The indicative scientific guidance is not a compulsory script or a substitute for the holistic descriptors.

Check units, calculations, sensible precision, axes, treatment of repeats and conclusions against raw data. Credit scientifically valid alternative methods approved for delivery. A repeated instrument reading, a new reaction mixture and a new biological specimen provide different kinds of replication.

At least five delivered activities are required. Record the actual entry count and identify any missing requirement for resolution before finalisation. The task bank samples the listed learning outcomes; it does not establish complete module coverage, and optional practicals do not prove that every learner has covered every listed outcome.

B01 · Comparing cells by light microscopy

Credit correct calibration at the actual objective, unit conversion and measurements attributable to individual cells. Total optical magnification is eyepiece magnification multiplied by objective magnification; drawing magnification requires image size divided by actual size in matching units.

Credit observed differences without requiring plant chloroplasts in non-photosynthetic epidermis. Light microscopy cannot resolve all organelles shown in textbook ultrastructure diagrams. Five cells from one specimen are not five independent organisms; evaluation should recognise the sampling limit.

B02 · Temperature and beetroot membrane permeability

Higher pigment concentration generally increases absorbance and decreases percentage transmission; do not reverse these relationships. Pigment release depends on damage to cellular membranes, including the tonoplast, and is an indirect measure of permeability.

Credit accurate unexpected data and reasoned limitations. Do not require a predetermined threshold temperature. Tissue size, cut-cell pigment, exposure time and cuvette condition can affect comparisons. Re-reading one cuvette is a technical repeat, not an independent tissue replicate.

B03 · Sucrose concentration and osmosis in potato tissue

Percentage mass change = 100 × (final mass − initial mass) / initial mass. A gain is positive and a loss negative. Credit a defensible interpolated zero crossing with appropriate precision; if no crossing is bracketed, credit explaining why a reliable estimate cannot be made.

At negligible net mass change, solution and tissue water potentials are approximately equal under the experimental conditions. This does not establish equal solute concentrations because tissue pressure potential can contribute. Blotting, exposure time and variation between pieces limit inference.

B04 · Mitosis in prepared garlic root-tip tissue

Mitotic index = number of cells in mitosis / total scorable cells; multiply by 100 only if reporting a percentage. Interphase belongs in the denominator but not the mitotic numerator. Stage counts must reconcile with the stated total.

Credit honest uncertain classifications and exclusions. Inference about duration assumes a representative, sufficiently large, asynchronously dividing population and comparable detection of stages; a single static sample is not direct timing. Do not reward invented drawings of stages not observed.

B05 · Identifying classes of biological molecules

The expected control observations are a blue-black iodine result for starch; a green/yellow/orange/brick-red Benedict’s change or precipitate for reducing sugar under the method conditions; a white emulsion for lipid; and violet/lilac for a positive biuret test. Record the actual sample key in the confidential delivery record before issue.

No universal answer key can identify the coded samples before the centre prepares them. Credit valid observations, use of controls and cautious conclusions. A negative result may reflect the test’s detection limit or interference; colour intensity alone is not a calibrated concentration.

B06 · Amylase concentration and starch breakdown

1/time has units of inverse time and is a relative endpoint rate, not a measured mass of product per second. Mean reciprocal rates and reciprocal mean times are different summaries; credit a clearly stated consistent method.

An endpoint between observations has limited time resolution. A reaction not completed by the stopping time has a bounded rate estimate, not a zero-time or infinite-rate result. Increasing enzyme concentration may increase rate while substrate is sufficient, but a strict linear pattern is not compulsory.

B07 · Glucose availability and yeast carbon dioxide production

Credit rates in volume per unit time from a stated interval, including use of a gradient. Compare corresponding intervals or justify a different interval. The no-added-glucose control may still produce gas from endogenous reserves.

Carbon dioxide can arise during aerobic respiration or alcoholic fermentation. Gas output alone does not establish exclusive anaerobic respiration; oxygen availability and gas dissolution affect interpretation. Do not require a monotonic increase at all concentrations.

B08 · Light availability and pondweed gas production

Collected gas volume is a better quantitative proxy than assuming all bubbles have equal volume. Distance is not a direct measured light intensity; an inverse-square estimate requires suitable source geometry and remains an approximation.

Credit a justified plateau or other observed response without requiring an ideal curve. Net oxygen output is influenced by respiration and dissolution; repeated measurements on the same shoot do not establish between-plant biological variation.