IQM3011 A1 Teacher marking reference

IQM3011 A1 Synthetic Biology Practical Portfolio Examples

This reference supports discussion of the selected exercise extracts. Marks and bands are proposed documentary judgements, subject to human subject review.

Current controlling sources: IQM3011_2026_Sample_Assessment_1_Candidate_Practical_Briefs_and_Log_v3; Coursework_Cover_Sheet_v3; Student_Marking_Rubric_v3; Staff_Teacher_Observation_Record_v3; Staff_Marks_Capture_And_Moderation_Sheet_v3; Staff_Marking_Rubric_and_Guidance_v3. Resolved bank identifier: IQM3011-A1-PB-2026-S; B01 is a separate practical. Synthetic supporting data files and figures are supplied with the staff-practice pack; they do not assert centre approval or delivery.

Apply the complete source rubric only to authentic complete portfolios. These evidence discussions identify selected strengths, limitations and focused feedback; they do not assign extract-level or final marks.

IQM3011 A1 exact holistic rubric

The source requires one combined holistic raw percentage out of 100 for the complete portfolio, applying AO2 and AO3 together. There are no entry marks, separate AO2/AO3 numerical marks, or invented weighting. Every band descriptor below is reproduced verbatim from the current staff rubric.

AO2 · Application, practice and data: 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: Explains and applies biology principles; interprets experimental evidence; relates theory to context; makes supported judgements; communicates procedures, results and conclusions clearly and accurately.

Band / range	AO2 source descriptor	AO3 source descriptor
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.

Band / range	AO2 source descriptor	AO3 source descriptor
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.

Judgement control: read AO2 and AO3 separately against sustained portfolio evidence, then identify one combined best-fit band and percentage. Do not score entries or weight objectives. Teacher observation supports the holistic judgement and is not separately weighted.

Using the selected extracts

These extracts support discussion of particular evidence only. None is a complete portfolio and none receives an extract-level numerical mark. Apply the full source rubric to an authentic, complete log; corroborate safety, independence and support using actual dated observation records.

Reference for Extract A S1 B03

AO2 evidence: the formula is signed, the 0.4 M and 0.6 M means genuinely bracket zero, and the candidate reports an approximate interpolation rather than an exact biological constant.

AO3 evidence: the response links mass gain/loss to net water movement and correctly distinguishes sucrose concentration from water potential. The graph and table should agree on means and spread.

Focused feedback: add independent pieces near the estimated crossing and explain how blotting and tissue variability limit the estimate. The extract does not establish actual conduct or a whole-portfolio band.

Reference for Extract B S2 B04

AO2 evidence: field counts reconcile to 100 scorable cells and the mitotic index 34/100 is correct. The displayed stage percentages use 34 as denominator but claim to be percentages of all scorable cells; on the stated denominator, the mitotic stages are 19%, 5%, 5% and 5%.

AO3 evidence: stage proportions must be interpreted with a consistent denominator. A static prepared slide does not directly measure stage duration; representativeness and comparable detection matter.

Focused feedback: retain the raw counts, state the denominator beside each percentage and recompute all stage proportions using the stated base. Do not infer a whole-portfolio score from this excerpt.

Reference for Extract C S3 B02

AO2 evidence: the raw table contains three undamaged-looking readings at 30.2 °C (0.38, 0.50 and 0.40 AU), but the candidate summary uses only two. The included-data mean is about 0.427 AU, not 0.39 AU.

AO3 evidence: excluding a value without a pre-stated rule creates selection bias and weakens the trend interpretation. The appropriate response is to preserve the observation and explain a justified, documented exclusion only if one exists.

Focused feedback: recalculate n=3 and update the figure and interpretation consistently. A colorimeter reading is indirect evidence of pigment leakage, not a direct membrane image.

Reference for Extract D S3 B08

AO2 evidence: the table identifies measured distance and the constructed microcapillary readings. However, repeated measurements use one shoot, not independent plant replicates.

AO3 evidence: distance is not a direct light-intensity measurement; the constructed temperatures also vary from 27.2 °C to 24.2 °C as distance increases. The data do not establish a linear light-intensity response or isolate light from temperature. Gas output is net output influenced by respiration and dissolution.

Focused feedback: label distance accurately, avoid the unsupported “straight line”/direct-causation claim, control temperature, and use a light meter and independent shoots if the aim is to estimate a light response. No extract-level mark is assigned.

Source identity and confidentiality

The resolved bank identifier is IQM3011-A1-PB-2026-S, with B01 as a separate activity. No centre-approved/delivered activity list, date, protocol version, B05 confidential sample key, or teacher observation is supplied. The seven-band rubric is the current source rubric; moderation and authenticity remain centre responsibilities.

All examples are synthetic staff-practice material and cannot be used as actual learner evidence. Background references do not substitute for the centre protocol.