IQM3011 A1 Teacher marking exercise

IQM3011 A1 Synthetic Biology Practical Portfolio Examples

The selected synthetic extracts below form an unmarked exercise. Apply the supplied assessment criteria, record evidence and propose marks or bands before consulting the separate teacher reference.

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.

Unmarked synthetic extracts for staff discussion only. Selected passages cannot establish a whole-portfolio band or mark; actual practical conduct, safety and independence require authentic evidence.

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.

Staff exercise instructions

The following selections are unmarked synthetic excerpts. Discuss only the visible evidence against the source rubric. Identify what is recorded, what is inferred and one focused feedback point. Do not assign a whole-portfolio band or mark from an extract. Actual safe conduct, independence, dates and delivery require authentic records. The matching CSV/raw data and figures remain visibly identified as synthetic.

Extract A S1 B03 osmosis record

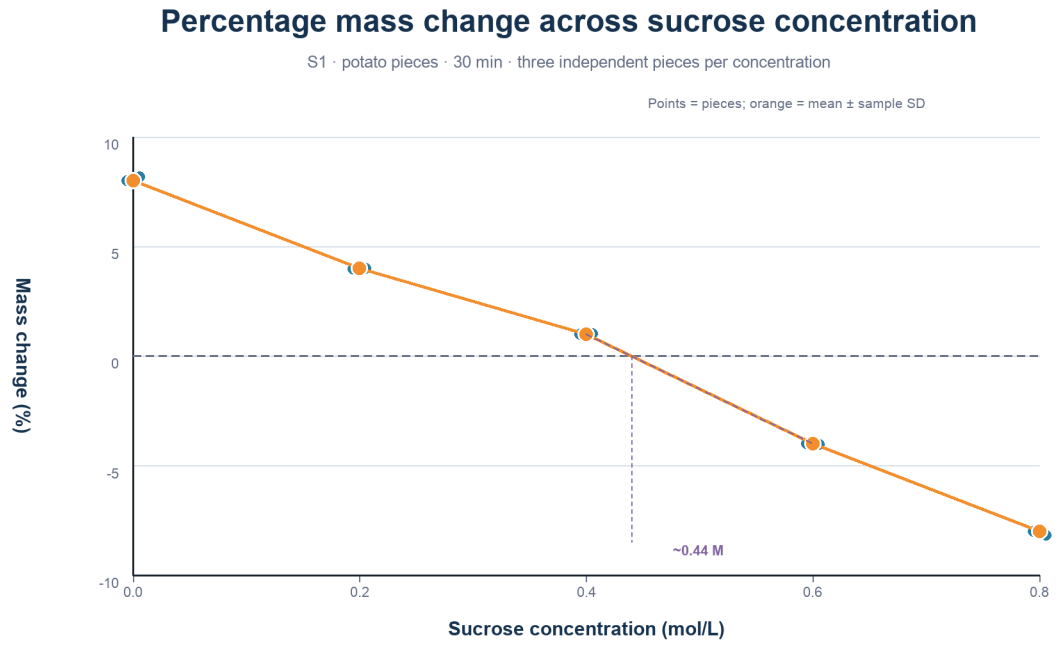
Context: fictional potato-tissue response across five sucrose concentrations; these data were generated for staff practice.

The following candidate paragraph is reproduced verbatim from the corresponding internal profile.

Processing and calculations: Worked signed percentage-change example: 100 × (1.08−1.00) g ÷ 1.00 g = +8.00%. Positive values represent mass gain; negative values represent loss. The group means and sample SD are shown in the table.

Analysis and biology interpretation: The mean signed mass change falls from +8.00% in distilled water to −8.00% at 0.8 mol L^{-1}. Water moves down a water-potential gradient across partially permeable membranes: positive mass change is consistent with net water entry and negative change with net water loss. The linearly interpolated zero between 0.4 M (+1.00%) and 0.6 M (−4.00%) is about 0.440 M under this constructed design, not a direct water-potential value.

Sucrose	n	Mean change (%)	Sample SD
0 M	3	+8.00	0.16
0.2 M	3	+4.00	0.04
0.4 M	3	+1.00	0.02
0.6 M	3	-4.00	0.04
0.8 M	3	-8.00	0.16



S1 B03 constructed percentage-change graph; unmarked teacher exercise extract.

Extract B S2 B04 mitosis record

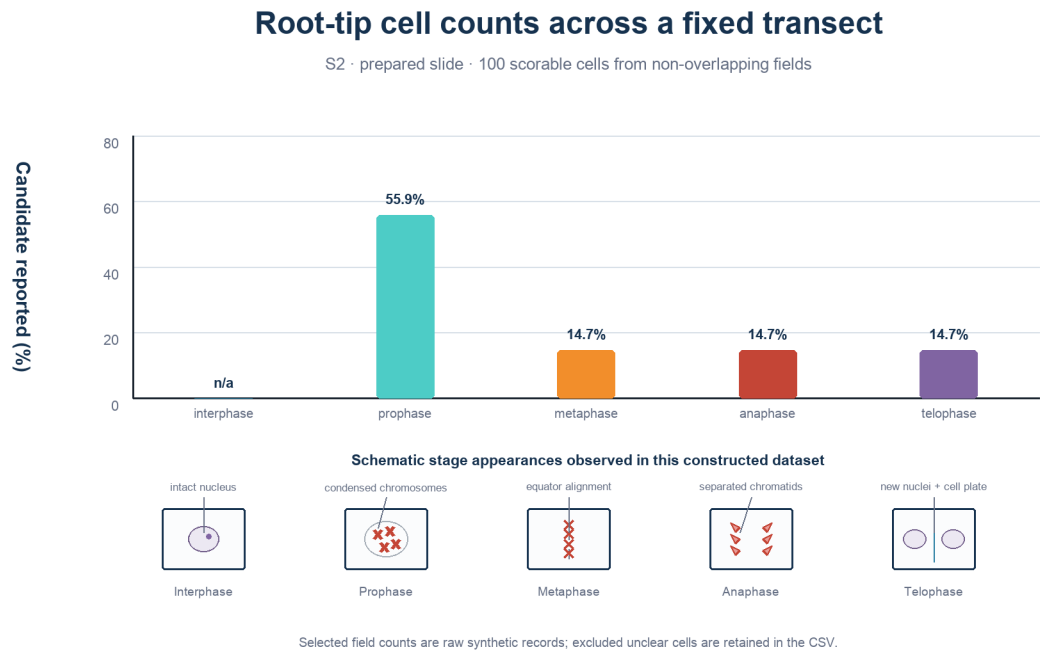
Context: fictional field counts from a prepared-slide scenario. The excerpt shows the candidate's mitotic-index calculation and declared stage percentages.

The following candidate paragraph is reproduced verbatim from the corresponding internal profile.

Processing and calculations: Mitotic index = 34/100 × 100 = 34%. Stage totals: interphase 66, prophase 19, metaphase 5, anaphase 5, telophase 5.

Stage percentages: prophase 19/34 × 100 = 55.9%; metaphase 5/34 × 100 = 14.7%; anaphase 5/34 × 100 = 14.7%; telophase 5/34 × 100 = 14.7%.

Stage	Count	Reported % of all scorable cells
Interphase	66	—
Prophase	19	55.88%
Metaphase	5	14.71%
Anaphase	5	14.71%
Telophase	5	14.71%



S2 B04 constructed observed-stage schematic; unmarked teacher exercise extract.

Extract C S3 B02 beetroot record

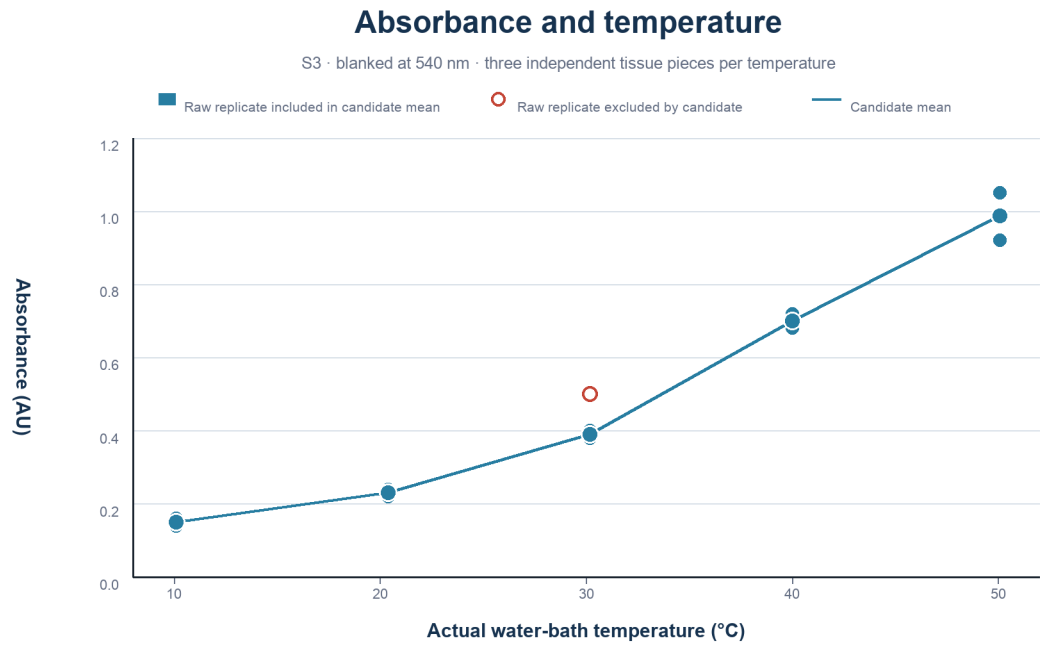
Context: fictional absorbance readings at 30.2 °C. The displayed excerpt includes the raw measurements and the candidate summary; no marking annotation is added.

The following candidate paragraph is reproduced verbatim from the corresponding internal profile.

Analysis and biology interpretation: At 30.2 °C I used 0.38 and 0.40 AU in my mean, giving 0.39 AU. I left out the 0.50 AU reading because it looked different from the other two. My means rise across the temperature groups, which I think is consistent with more pigment appearing in the liquid at higher temperatures.

Fictional raw readings at 30.2 °C: 0.38, 0.50 and 0.40 AU.

Actual temp.	n used	Mean AU	Sample SD
10.1 °C	3	0.15	0.01
20.4 °C	3	0.23	0.01
30.2 °C	2	0.39	—
40 °C	3	0.7	0.02
50.1 °C	3	0.9867	0.06506



S3 B02 constructed absorbance graph; unmarked teacher exercise extract.

Extract D S3 B08 pondweed record

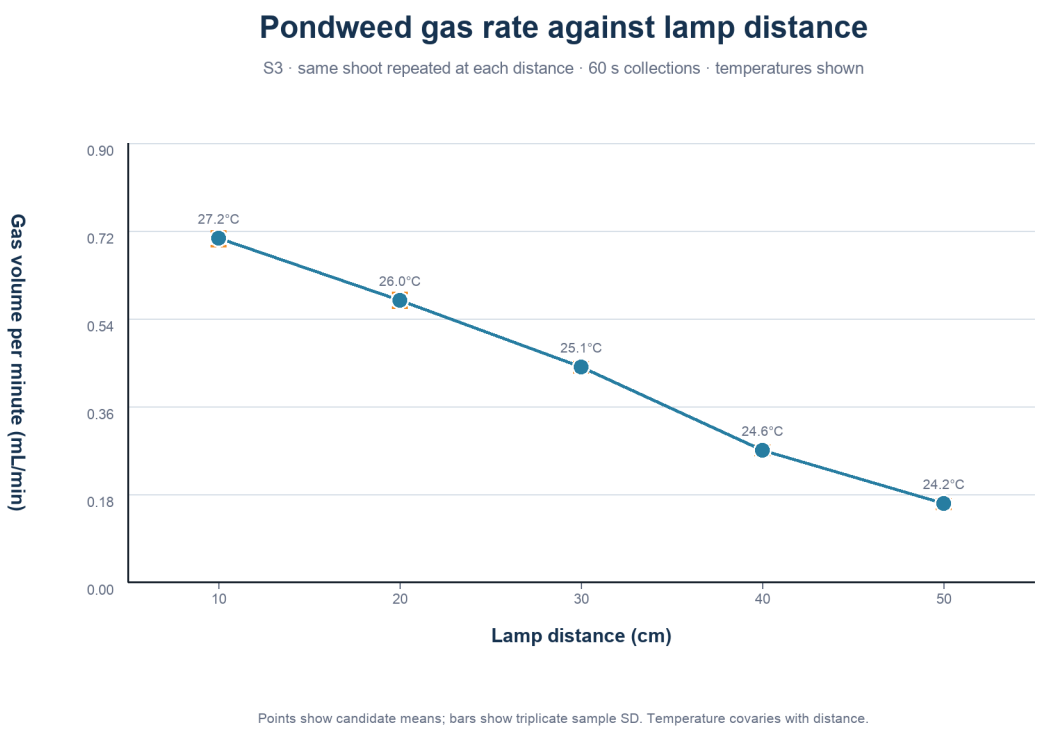
Context: fictional gas-volume readings at measured lamp distances, using a calibrated microcapillary in the constructed scenario.

The following candidate paragraph is reproduced verbatim from the corresponding internal profile.

Conclusion: I treated distance as the light-intensity value. As distance increases the gas rate falls in a straight line, so light intensity directly determines the response.

Distance	Temp. (°C)	Mean gas rate (mL min^{-1})	Sample SD
10 cm	27.2	0.7033	0.01528
20 cm	26	0.5767	0.01528
30 cm	25.1	0.44	0.01

Distance	Temp. (°C)	Mean gas rate (mL min^{-1})	Sample SD
40 cm	24.6	0.27	0.01
50 cm	24.2	0.16	0.01



S3 B08 constructed gas response by measured distance; unmarked teacher exercise extract.

Source and confidentiality note

Staff-only exercise. The current controlled student brief restricts AI to planning, not submitted observations, data, analysis, evaluation or conclusions. All values and drawings used here were generated synthetically for staff practice, not derived from a real learner or a centre sample key.