Draw a Small Sprout: Stem, Cotyledon Leaves, and Growth Stages

Original tasks 1, 2, 3 / complete keys

Task 1

A stem is 8 cm tall and its middle offset is 2.4 cm. Does it pass the one-quarter offset check? Show the arithmetic.

Answer: No. One quarter of 8 cm is 2 cm, and 2.4 cm is greater than 2 cm.

Reason: The check compares the middle offset to one quarter of the stem height. 8 divided by 4 equals 2, so 2.4 exceeds the limit.

Check: Divide the stem height by 4 and compare the result with the measured offset.

Task 2

A cotyledon leaf is 5 cm long and 2.5 cm wide. State its width ratio and whether it passes the 0.4 to 0.6 check.

Answer: The width ratio is 0.5, so it passes.

Reason: Width ratio equals width divided by length. 2.5 divided by 5 equals 0.5, which lies between 0.4 and 0.6.

Check: Divide the widest width by the leaf length and compare with 0.4 and 0.6.

Task 3

A true leaf is 1.2 cm long and a cotyledon leaf is 3 cm long. Does the true leaf pass the one-third limit? Show the arithmetic.

Answer: No. One third of 3 cm is 1 cm, and 1.2 cm is greater than 1 cm.

Reason: The limit is one third of the cotyledon leaf length. 3 divided by 3 equals 1, so 1.2 exceeds it.

Check: Divide the cotyledon leaf length by 3 and compare with the true leaf length.

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Original tasks 4 / complete keys

Task 4

In a four-panel growth sequence, panel one shows a seed on the baseline, panel two shows a cracked seed with a root tip, panel three shows closed cotyledons, and panel four shows open cotyledons with a true leaf. State two checks that confirm the sequence is consistent.

Answer: Check that all four panels share the same baseline and midline, and check that the stage numbers increase from one to four without gaps.

Reason: A consistent sequence needs a shared spatial reference and an ordered set of stage labels. These two checks confirm alignment and order.

Check: Place a straightedge along the baseline and midline across all panels, then read the stage numbers in order.

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Source rubric / reflection

- [ ] Stem is one smooth curve from baseline to midline top.
- [ ] Stem middle offset is no more than one quarter of stem height.
- [ ] Each cotyledon leaf has a visible midline from base to tip.
- [ ] Each cotyledon leaf width ratio is between 0.4 and 0.6.
- [ ] Cotyledon leaves sit on opposite sides of the stem top.
- [ ] True leaf is no longer than one third of a cotyledon leaf.
- [ ] Growth sequence uses four panels with a shared baseline and midline.
- [ ] Labels use stage numbers only, with no invented timing claims.

Reflection: What did you check, what did you change, and what will you try next?