

Solutions

2.1

: Micrographia.: 1665. This date concerns the supplied historical event, not a claim that Hooke alone established all cell theory.

2.2

: A is prokaryotic because DNA is not enclosed in a nucleus.: B is plant-like eukaryotic from its nucleus, wall and chloroplasts.

2.3

: magnification = image length / actual length.: $M = 30.0 \text{ mm} / 0.0500 \text{ mm} = 600.$: compatible length units cancel; it may be stated as $\times 600$.

2.4

each: A does have recorded DNA; chloroplasts in B do not establish that all plant cells contain them; 30 mm is the printed image length, while actual supplied length is 0.0500 mm. Growth is addressed separately in the evaluation.

3.1

each: define light conditions as the changed factor; choose a specified growth measure and period; use comparable seedlings; keep watering or other stated conditions comparable; obtain approved safe procedures and repeated observations; do not infer results from cell shape or report a growth effect before data exist.

3.2

Local analytic rubric, 8 $\times$: recognise A's DNA; classify A; classify B with evidence; avoid universal chloroplast claim; state real image distinction; give $\times 600$ ratio; reject shape-based growth claim; describe the approved investigation as pending; coherent truthful 80–110 word response. Example: "The supplied description supports a prokaryotic interpretation of A because its DNA is not enclosed in a nucleus; it does not lack DNA. B has a nucleus, wall and chloroplasts, supporting a plant-like eukaryotic interpretation. These structures do not show that every plant cell has chloroplasts. The printed cell length is 30.0 millimetres, while its supplied actual length is 0.0500 millimetres, giving a magnification of six hundred. Shape alone does not establish growth rate. The proposed light comparison needs an approved procedure, comparable seedlings, controlled watering and a defined growth measure before any result is reported."