Seeds, fruits and plant clones

Student activity • observation and reasoning

YEAR 11 / LESSON 83 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How do flowers produce seeds, and how can plants reproduce without them?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, pencil and ruler
- Pollen-tube, seed, runner and stem-cutting reference diagrams

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Shared Biology / Double Award: 3.4, 3.6–3.7. Fertilisation and asexual methods.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Sequence pollen germination, pollen-tube growth through the style and delivery of a male nucleus to the ovule.

2. Explain fusion with the egg nucleus and the development of the ovule into a seed and ovary into fruit in the standard flowering-plant model.

3. Explain use of stored reserves by a germinating seed before effective photosynthesis.

4. Draw a strawberry runner producing a new rooted plant and identify it as asexual reproduction.

5. Plan propagation from a suitable stem cutting with a node, controlled moisture and appropriate light, using the supplied diagrams; this lesson does not carry out cutting or use rooting chemicals.

6. Compare genetic similarity in runners/cuttings with variation among sexually produced seeds.

Cleanup

• Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

A pollen tube transports male gametes towards an ovule. After fertilisation the seed contains an embryo and reserves; fruit develops from the ovary in the simple model. Runners and cuttings produce genetically very similar plants apart from mutation. No rooting chemicals or cutting blades are used by pupils in this paper-planning activity.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. What is the pollen tube’s role?

2. What normally becomes the seed?

3. What normally becomes the fruit?

4. How does an early seedling obtain respiratory substrate?

5. Is a runner sexual reproduction?

6. Why can clones differ in growth?