Sexual and asexual reproduction

Student activity • observation and reasoning

YEAR 11 / LESSON 81 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How do reproductive processes affect genetic similarity?

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

Equipment

- Student booklet, pencil and ruler
- Paper for gamete and fertilisation models

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

Course coverage: Shared Biology / Double Award: 3.1–3.2. Reproduction and fertilisation.

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. Compare reproduction involving gamete fusion with reproduction without gamete fusion.

2. Draw fertilisation as fusion of gamete nuclei forming a zygote, followed by mitotic divisions and embryo development.

3. Explain why offspring from sexual reproduction generally contain new combinations of alleles.

4. Explain that asexual offspring are genetically very similar to the parent apart from mutation, while environments can still affect phenotype.

5. Compare potential advantages in stable versus changing environments without claiming one mode is always superior.

6. Correct the claim that all reproduction requires two individual parents: self-fertilisation can still be sexual.

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

Sexual reproduction involves gamete fusion; asexual reproduction does not. The number of individual parents alone is not a sufficient definition. A zygote develops through cell division and differentiation. Models show general principles rather than every organism's life cycle.

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 defines sexual reproduction?

2. What is a zygote?

3. Which division supports embryo growth?

4. Are asexual offspring always identical in appearance?

5. Can self-fertilisation be sexual?

6. Why can variation be useful?