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Reproduction and continuity of life





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Reproduction and continuity of life

A new individual from one parent



THE IDEA

Asexual reproduction does not fuse gametes. Binary fission divides one cell into two; budding forms an outgrowth that can separate.

Offspring are often genetically very similar to the parent, though copying changes can occur. Reproduction continues a lineage; it is not required for one individual's immediate survival.

CHECK YOUR THINKING

Which process involves no fusion of gametes?

A Budding in yeast.

B Fusion of sperm and egg.

A. Asexual reproduction produces offspring without fertilisation.

A RELATED EXAMPLE

Different organisms use different routes

Fission is not the same as fragmentation. Multiple fission produces many offspring from one cell. Fragmentation can produce new organisms from body pieces in suitable organisms. Spores can disperse and grow under favourable conditions. Regeneration repairs or regrows parts; not every detached animal part becomes a new individual.

Reproduction and continuity of life

Challenge the promise



THE IDEA

A seller says, “All these cuttings are identical, so the crop is safe.” Identify the useful feature in the claim. Then identify the unsupported conclusion.

Explain how growing several suitable varieties could change the risk.

CHECK YOUR THINKING

What is the best response?

A Uniform traits do not guarantee resistance to a shared disease.

B Identical plants must resist every disease equally well.

A. Uniformity is different from resistance; a shared weakness can affect the whole crop.

A RELATED EXAMPLE

Choose a propagation plan

A nursery needs many plants with a parent's useful trait. Vegetative propagation can preserve that trait more reliably than seed offspring from mixed parents. But if one disease can infect the shared genotype, many plants may be vulnerable. A strong plan weighs speed and risk.

Reproduction and continuity of life

Follow the pollen tube



THE IDEA

Fertilisation happens after a journey. Compatible pollen can germinate on the stigma. A pollen tube grows through the style towards an ovule.

A male gamete fuses with the egg to form a zygote. The ovule develops into a seed; the ovary commonly develops into a fruit.

CHECK YOUR THINKING

Which structure usually develops into the seed?

A The ovule.

B The whole petal.

A. The fertilised ovule develops into a seed, while the ovary commonly forms fruit.

A RELATED EXAMPLE

Pollination is transfer, not fusion

Pollen must reach a suitable stigma. Self-pollination transfers pollen within the same flower or plant; cross-pollination transfers between plants of the same species. Wind, water or animals can carry pollen. Flower features influence the likely route; cross-pollination can increase genetic mixing.

Reproduction and continuity of life

Reproductive maturity involves change



THE IDEA

Puberty prepares reproductive systems. Hormones guide reproductive maturation and secondary sexual characteristics. Timing varies between individuals.

Biological ability to reproduce is not the same as emotional readiness or permission. Discuss the science respectfully, without comparing classmates' bodies.

CHECK YOUR THINKING

Which statement is accurate?

A Puberty timing varies between people.

B Everyone develops on exactly the same timetable.

A. Biological development has a normal range of variation.

A RELATED EXAMPLE

Fertilisation can happen inside or outside

The location changes the challenges. Many aquatic animals release gametes into water for external fertilisation. Internal fertilisation occurs within the female body. Egg-laying and live-bearing describe where development continues, not simply where fertilisation occurs. Birds lay eggs after internal fertilisation.

Reproduction and continuity of life

Pregnancy requires support and exchange



THE IDEA

The embryo develops in the uterus. The placenta supports exchange of oxygen, nutrients and wastes between maternal and fetal circulation, normally without their blood mixing directly.

The embryo develops into a fetus; birth follows pregnancy. Health, nutrition and professional prenatal care matter for both parent and baby.

CHECK YOUR THINKING

What does the placenta support?

A Direct sharing of a single undivided blood supply.

B Exchange across an interface between the circulations.

B. Materials cross the placental interface while the circulations normally remain distinct.

A RELATED EXAMPLE

A cycle prepares a lining

Menstruation is a normal biological process. Hormones coordinate egg development and changes in the uterine lining. If pregnancy does not occur, the lining is shed during menstruation. Cycle length varies; a 28-day diagram is a teaching model, not a rule for everyone. The blood is not “dirty” or evidence of impurity.

ONE LAST CHALLENGE

How many chromosomes are in each gamete and in the zygote?

In a diploid species, a typical body cell has 20 chromosomes. Two normal gametes fuse.

FOLLOW THE CHROMOSOME COUNT

Body cell	20 chromosomes
Gamete	Half the body-cell count
Zygote	Two gamete sets combined

THE REVEAL

10 per gamete and 20 in the zygote.

Meiosis halves the chromosome number. Fertilisation combines two sets of 10.

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