

GRADE 9 | 2024

Biology: Reproduction and Genetics

Natural Sciences

CAPS ALIGNED

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1. Asexual Reproduction

Only ONE parent is needed. Offspring are genetically identical to the parent (clones).

- Binary fission: bacteria split in two
- Budding: yeast; a small bud grows off the parent
- Spore formation: fungi and some plants
- Vegetative reproduction: plants grow from roots, stems, leaves
- Fragmentation: pieces grow into new organisms

2. Sexual Reproduction

TWO parents contribute genetic material. Offspring are genetically unique.

Human Reproductive Systems

- Male: testes produce sperm; sperm travels through vas deferens
- Female: ovaries produce eggs (ova); eggs travel through fallopian tubes
- Fertilisation occurs in the fallopian tube

3. Genetics

Genetics is the study of how traits are inherited from parents to offspring.

Key Terms

- Gene: a section of DNA that codes for a trait
- Allele: alternative forms of a gene (e.g. tall or short)
- Dominant allele: always expressed if present (capital letter)
- Recessive allele: only expressed when homozygous (lowercase letter)
- Genotype: genetic makeup (e.g. Tt, TT, tt)
- Phenotype: physical appearance (e.g. tall, short)

FORMULA: Homozygous dominant: TT (two dominant alleles)

Heterozygous: Tt (one of each)

Homozygous recessive: tt (two recessive alleles)

4. Punnett Squares

A Punnett square shows all possible offspring from a cross between two parents.

EXAMPLE: Monohybrid cross

Tall (Tt) x Tall (Tt):

TT: 25% (tall), Tt: 50% (tall), tt: 25% (short)

Phenotypic ratio: 3 tall : 1 short

Genotypic ratio: 1TT : 2Tt : 1tt