

Senior 1, Cluster 1: Reproduction

Overview

Reproduction is an essential biological mechanism for the continuity and diversity of species. Students compare sexual and asexual methods of reproduction in this cluster. They learn how the human reproductive system functions and describe the major stages of human development from conception to birth. Students recognize that the nucleus of a cell contains genetic information and is responsible for the transmission of traits from one generation to the next. They also discuss factors that may change a cell's genetic information, including environmental factors. Using the knowledge they have gained, students also address a current biotechnology issue.

Students will...

S1-1-01 Illustrate and explain the process of mitotic cell division in plants and animals.

Include: chromosomes, mitosis, cytoplasmic division, cell cycle.

GLO: D1, E1, E2

S1-1-02 Observe and explain the dynamic nature of cell division.

GLO: C2, D1, E3

S1-1-03 Describe various types of asexual reproduction that occur in plant and animal species.

Examples: fission, budding, sporulation, vegetative propagation, regeneration...

GLO: D1, E1

S1-1-04 Investigate and describe agricultural applications of asexual reproduction.

Examples: cloning, cuttings, grafting, bulbs...

GLO: A5, B1, B2, D1

S1-1-05 Illustrate and explain the production of male and female gametes by meiosis.

GLO: D1, E1, E2

S1-1-06 Compare and contrast the function of mitosis to that of meiosis.

Include: diploid cells, haploid cells.

GLO: D1, E1

S1-1-07 Compare sexual and asexual reproduction in terms of their advantages and disadvantages for plant and animal species.

GLO: D1, E1

S1-1-08 Investigate and explain adaptations of plant and animal species which enhance reproductive success.

Examples: appearance, behaviour, number of gametes or offspring, chemical cues...

GLO: D2, E1, E2

S1-1-09 Describe the structure and function of the male and female human reproductive systems.

Include: role of hormones.

GLO: D1, E1, E2

S1-1-10 Outline human development from conception through birth.

Include: X and Y chromosomes, zygote, embryo, fetus.

GLO: D1, E1, E2, E3

S1-1-11 Observe, collect, and analyze class data of single trait inheritance.

Examples: hand clasping, earlobe attachment, tongue rolling...

GLO: C2, D1

S1-1-12 Differentiate between dominant and recessive genes.

Include: genotype, phenotype.

GLO: D1, E1, E2

S1-1-13 Describe the relationships among DNA, chromosomes, genes, and the expression of traits.

Include: genetic similarity among all humans.

GLO: A2, D1, E1, E2

S1-1-14 Explain the inheritance of sex-linked traits in humans and use a pedigree to track the inheritance of a single trait.

Examples: colour blindness, hemophilia...

GLO: D1, E1, E2

S1-1-15 Investigate and describe environmental factors and personal choices that may lead to a genetic mutation or changes in an organism's development.

Examples: fetal exposure to alcohol, overexposure to sunlight, toxins, hormone mimics, food additives, radiation...

GLO: B1, B3, D1, D2

S1-1-16 Investigate Canadian and international contributions to research and technological development in the field of genetics and reproduction.

Example: Human Genome Project...

GLO: A3, A4, B1, B2

S1-1-17 Discuss current and potential applications and implications of biotechnologies including their effects upon personal and public decision making.

Include: genetic engineering, genetic screening, cloning, DNA fingerprinting.

GLO: B1, B2, C4, C8

S1-1-18 Use the decision-making process to address a current biotechnology issue.

GLO: C4, C6, C7, C8