REPRODUCTION & THE VARIETY OF LIFE

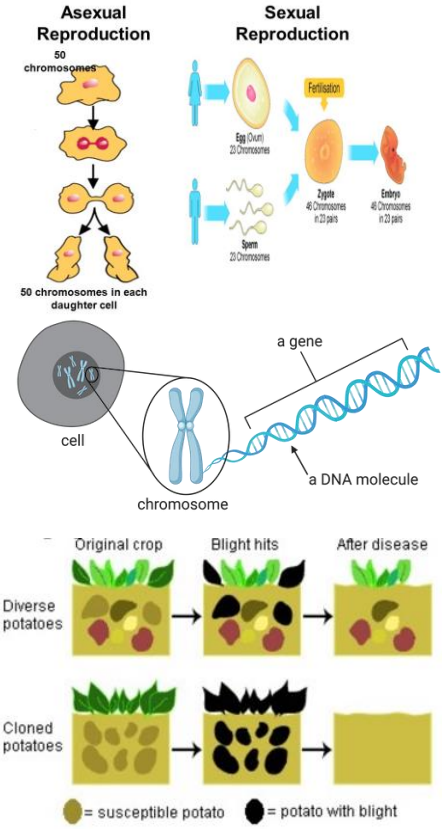
Science 9 – Ms. Ahsan, 2026

Name:
Block:
Date:

Why is Genetic Diversity Important?

Recall the following terminology:

- Asexual reproduction: Reproduction involving one parent, results in many genetically identical offspring.
- Sexual reproduction: Reproduction involving two parents, results in genetically varied offspring.
- Genes: Parts of the DNA sequence, responsible for different traits (like eye colour).
- Traits: A trait is a characteristic that can be inherited from the genes of a parent (like eye colour).



What is genetic diversity?

- Genetic diversity is the variety of inherited genetic information within a species.
  - High diversity means that there are a wide range of traits.
  - Low diversity means that there are limited traits or all the individuals are genetically similar.
- Genetic diversity allows species to survive.
  - If an environment changes, a diverse population is more likely to have some individuals who have the right traits they need to survive.
  - Similarly, low genetic diversity makes a species vulnerable to extinction because one single event could wipe out everyone.

Asexual Reproduction: Lower Genetic Diversity

- Because the offspring from asexual reproduction are genetically identical, species that reproduce asexually often have low genetic diversity.
- Advantages of Asexual Reproduction
  - Only one parent is needed (no need to find a mate)
  - Reproduction occurs quickly
  - Offspring mature and start reproduction quickly
  - Offspring are genetically identical to the parent and can live and interact with their environment with the same success as their parent.
- Disadvantages of Asexual Reproduction
  - Lack of genetic diversity – all individuals in a population are vulnerable to changes in their environment (examples: drought, disease)
  - Since all of the individuals are genetically identical, they will all respond in the same way.

Sexual Reproduction: Higher Genetic Diversity

- In sexual reproduction, offspring receive genetic information from two parents.
- As a result, each offspring is a unique combination of genetic information from both of their parents.
- Advantages of Sexual Reproduction
    - Genetic diversity allows some individuals in a population to survive if the environment changes.
        - If the environment changes, some individuals will be less successful at living and reproducing.
        - Other individuals may have certain features (due to genetic differences) that allow them to live and reproduce in the new conditions more easily.
- Disadvantages of Sexual Reproduction
    - Searching for a mate takes time and may expose individuals to predators, disease, or harsh environmental conditions
    - Fewer offspring are produced (takes longer for the population to grow)
    - Offspring take longer to reach maturity (and reproduce)
    - Offspring require a lot of time and energy to raise until they are independent of their parents