

McGraw-Hill Ryerson

BC Science CONNECTIONS



BC Science Connections 9

**Unit 1: The continuity of life depends on cells being
derived from cells**

Topic 1.4: How does reproduction contribute to the variety of life on Earth?

- Asexual reproduction results in many genetically identical offspring in a short amount of time.
- Sexual reproduction results in genetically varied offspring.

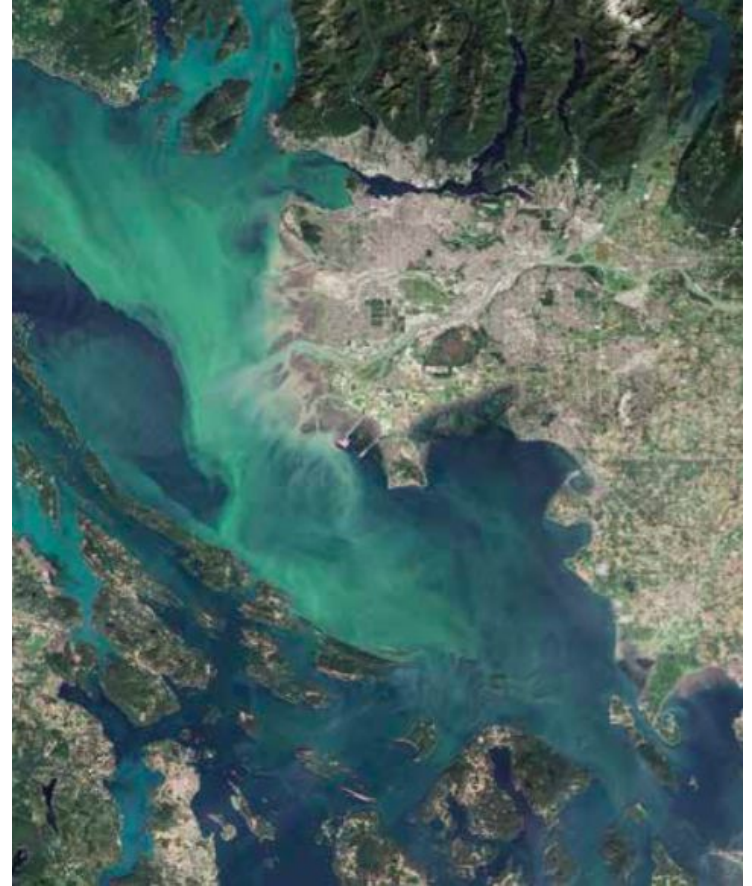


Concept 1: Asexual reproduction results in many genetically identical offspring in a short amount of time.

Algae are plant-like organisms that mainly reproduce asexually

- Can multiply very quickly under optimum temperature and nutrient conditions to form an algal bloom
- Algal blooms pollute shellfish and make them toxic

Figure 1.24: Algal blooms are a common sight along the Pacific coast any time of year but especially in the summer. Why would algal blooms be especially common in summer?



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
 - 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 (example: drought, disease)
 - Since all the individuals are genetically identical, they will all respond in the same way (example: die or become diseased)



Figure 1.26: If the conditions change or a disease occurs, it may cause a crop to die or the yield of produce to be severely reduced.

Discussion Questions

1. Describe one advantage and one disadvantage of asexual reproduction. Give an example of each.

Concept 2: Sexual reproduction results in genetically varied offspring.

Genetic variation:

- Variation in the DNA sequences of each individual in a species
- Variation in DNA results from sexual reproduction



Figure 1.27: Although members of this family share similar traits, their different genetic material makes them unique individuals.

Advantages of Sexual Reproduction

Genetic variation/diversity

- Genetic diversity allows some individuals in a population to survive if the environment changes

Example:

- 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 a 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 from their parents



Discussion Questions

1. Describe one advantage and one disadvantage of sexual reproduction. Give an example of each.

Topic 1.4 Summary: How does reproduction contribute to the variety of life on Earth?

- Asexual reproduction results in many genetically identical offspring in a short amount of time.
- Sexual reproduction results in genetically varied offspring.

