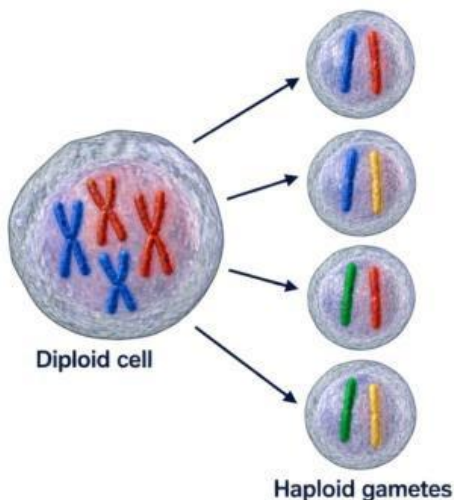
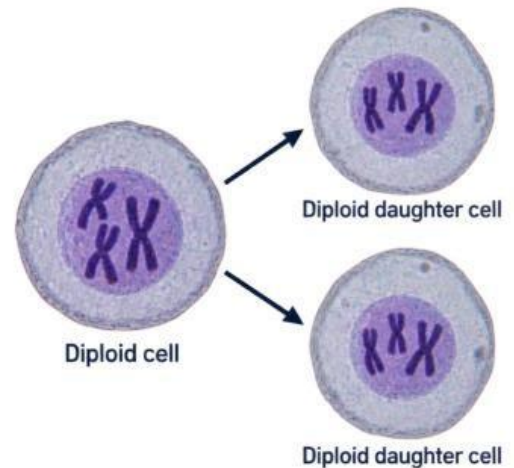


Asexual and Sexual Reproduction

Part 1: Reading Passage

All living things must reproduce to pass their genetic material to future generations. Organisms use two primary strategies: **asexual reproduction** and **sexual reproduction**. Understanding how these strategies work, as well as the cellular processes behind them, reveals how life thrives on Earth.

Asexual reproduction involves a single parent. Because there is only one source of genetic material, the offspring are genetically identical to the parent (often called clones). At the cellular level, asexual reproduction in eukaryotic organisms relies on **mitosis**. During mitosis, a parent cell duplicates its DNA and divides into two genetically identical daughter cells. Organisms such as bacteria (via binary fission), yeast (via budding), and strawberry plants (via runners) use asexual reproduction to multiply rapidly.



Sexual reproduction involves two parents. Each parent contributes specialized sex cells called **gametes** (sperm and egg cells). Gametes are produced through a distinct type of cell division called **meiosis**. Unlike mitosis, meiosis reduces the number of chromosomes by half and shuffles genetic information, resulting in four unique daughter cells. When fertilization occurs, the sperm and egg combine to restore the full set of chromosomes, producing an offspring with a unique mix of traits from both parents. Animals, flowering plants, and many fungi reproduce sexually.

Comparing Advantages and Disadvantages

Both strategies offer distinct biological trade-offs depending on environmental pressures and resource availability.

Method	Advantages (Pros)	Disadvantages (Cons)
Asexual Reproduction	- Requires only one parent (no need to find a mate) - Rapid population growth in a short time - Requires less time and energy	- Zero genetic variation among offspring - Vulnerable to environmental changes; a single disease can wipe out the entire population
Sexual Reproduction	- High genetic diversity among offspring - Increased chance of species survival in changing environments - Harmful mutations are less likely to affect all individuals	- Requires two parents and finding a mate - Slower process that produces fewer offspring - Requires significantly more energy

Part 2: 10-Question Review Quiz

1. How many parents are required for asexual reproduction?

- A) Zero B) One C) Two D) Four

2. Which type of cellular division produces genetically identical daughter cells during asexual reproduction?

- A) Mitosis B) Meiosis
C) Fertilization D) Pollination

3. Specialized sex cells (sperm and egg) are produced through which process?

- A) Binary fission B) Mitosis
C) Meiosis D) Regeneration

4. Why are offspring produced through asexual reproduction considered "clones"?

5. What is the primary advantage of sexual reproduction over asexual reproduction?

- A) It requires far less energy B) It creates genetic diversity
C) It happens much faster D) It requires only one organism

6. How does the number of chromosomes in a gamete compare to the parent cell?

A) It has double the chromosomes

B) It has half the chromosomes

C) It has the exact same count

D) It has zero chromosomes

7. State **two** disadvantages of sexual reproduction.

8. A farmer plants an entire field of genetically identical potato plants using asexual cloning. Explain what might happen to the crop if a new fungal disease enters the field.

9. Decide whether each statement describes **Asexual (A)** or **Sexual (S)** reproduction. Write the correct letter in each blank cell.

Characteristic	A or S
Produces offspring with a unique combination of parent traits	
Uses mitosis to produce identical daughter cells	
Organism does not need to spend time or energy finding a mate	
Gametes combine during fertilization	

10. Complete the comparison statement:

Mitosis results in _____ identical daughter cell(s), whereas meiosis results in _____ unique gamete cell(s).