

**CHAPTER 16****ANSWER KEY****Comparing Life Cycles  
Exercise Answer Key****BLM 16.4.7A**

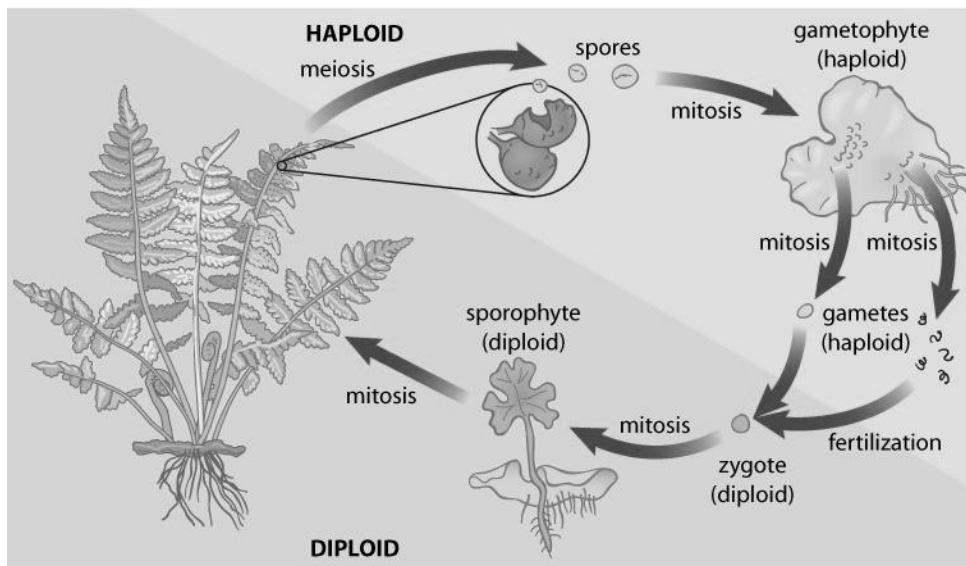
1. Asexual reproduction is a reproductive process in which the parent organism produces genetically identical offspring. This process differs from sexual reproduction, a reproductive process that produces genetically distinct offspring. Sexual reproduction involves the production of gametes via meiosis, followed by fertilization between genetically distinct gametes from two parents. Asexual reproduction, on the other hand, occurs via mitosis. No fertilization by a second parent is required.
2. Occurring in bacteria, binary fission results in two genetically identical daughter cells. The process begins with the attachment of the circular bacterial chromosome to the bacterial cell wall. As the chromosome replicates, the new chromosome also attaches to the cell wall. The elongation of the cell and the formation of a septum then separates the two chromosomes. Some bacteria are also able to reproduce via conjugation. Conjugation involves the transfer of genetic material from one cell to another by cell-to-cell contact through a bridging structure called a pilus. During conjugation, one bacterium transfers all or part of its chromosome to another bacterium. The receiving bacterium then undergoes binary fission. Conjugation creates cells with new genetic combinations, and thereby provides a chance that some bacteria may be better adapted to changing conditions. It can only take place between non-identical bacterial cells.
3. Parthenogenesis is a form of asexual reproduction in which an unfertilized egg develops into an adult. Parthenogenesis may be advantageous for a small, mainly female population as no mate is required for the females to reproduce.
4. The term alternation of generations refers to the life cycle of plants only, which consists of two generations: a haploid generation and a diploid generation that alternate. Some animal life cycles, however, alternate between asexual-reproducing phases and sexual-reproducing phases. This is known as alternation in sexual cycles.
5. Advantages of asexual reproduction may include any two of the following:
  - Asexual reproduction often proceeds more quickly than sexual reproduction, and it does not require the presence of a second parent organism.
  - Asexual reproduction usually requires less energy than sexual reproduction.
  - Many forms of asexual reproduction, such as vegetative reproduction and budding, help to maximize the chances that individual offspring will survive. In these forms of asexual reproduction, the daughter organism does not fully separate from the parent until it is capable of independent survival.

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Advantages of sexual reproduction may include any two of the following:

- Sexual reproduction offers a population a way to adapt to a changing environment. At least some offspring, for example, may have a greater ability to resist parasites or toxins in the environment or to take advantage of new food sources.
- Competition among siblings may be reduced if they are genetically diverse.
- Pairing of homologous chromosomes and crossing over offer opportunities to replace or repair damaged chromosomes.

6.



- 7.
- False. Binary fission results in genetically identical daughter cells.
  - True
  - True
  - False. Spores may be the haploid products of meiosis as well.
  - False. although genetic material is exchanged in conjugation, conjugation is not a form of sexual reproduction because there is no formation or fertilization of gametes.
  - False. The diploid generation of a plant is called a sporophyte and the haploid generation is called a gametophyte.
  - True
  - False. Moss reproduces sexually via alternation of generations.
  - True