Name Date

Section 5.2 Summary

Asexual Reproduction

Textbook pages 166–183

Before You Read

What kinds of organisms reproduce by making exact copies of the parent organism? Give three or four examples on the lines below.

_____

_____

Create a Quiz

After you have read this section, create a five-question quiz based on what you have learned. After you have written the questions, be sure to answer them. Then share them with your classmates.

What is asexual reproduction?

Asexual reproduction is the formation of a new individual that has the same genetic information as its parent. The individual is a clone, or an exact copy, of its parent. Asexual reproduction occurs in one-celled organisms such as bacteria and in multicellular organisms such as plants.

What types of asexual reproduction are there?

There are several types of asexual reproduction, as shown in the table below.

Type of asexual reproduction	Definition	Examples of organisms that use this form of reproduction
binary fission	the splitting of a single parent cell into two equal parts that have the same copies of genetic material	• some kinds of bacteria • amoeba
budding	a group of rapidly dividing cells develops on an organism and breaks away to become a new organism	• some simple multicellular organisms such as hydras and sponges • one-celled yeasts
fragmentation	a small piece of an organism breaks away from it and develops into a new individual	• some plants, such as mosses and liverworts • some animals, such as some sea stars and corals
spore formation	parent organism produces spores: single cells that can develop into new individuals by repeated mitosis	• common in fungi • some plants and algae
vegetative reproduction	special cells, usually in the stems and roots of plants, divide repeatedly to form structures that develop into a plant that is identical to the parent	• very common in most kinds of plants

What are the advantages and disadvantages of asexual reproduction?

Advantages of asexual reproduction include:

- large colonies can out-compete other organisms for nutrients and water
- large numbers of offspring reproduce very quickly
- species can survive if the number of predators increases

Disadvantages of asexual reproduction include:

- offspring compete for food and space
- extreme temperatures can wipe out entire colonies
- negative mutations can destroy many offspring ✔

Reading Check

1. What is one advantage of asexual reproduction?

What technologies make use of asexual reproduction?

Humans can help other organisms reproduce asexually. This may be done to preserve the DNA of an organism. It may also be done to make large numbers of a particular type of organism that has a useful trait.

Growing new plants from the cut ends of plant stems and roots is one way that humans make clones of plants. Making clones of animals involves taking the nucleus from one type of cell and putting it into an egg cell that has had its nucleus removed. As the egg cell divides, its new cells have the DNA from the first type of cell.

Researchers are now using stem cells in cloning research. **Stem cells** are cells that can divide to form one of many different types of cells. Stem cells that come from human embryos can become any of the 200 types of cells in the human body. Stem cells that come from specific body tissues can become only a few types of body cells. Doctors are working to use stem cells to treat certain disorders such as diabetes and cancer. ✔

Reading Check

2. What are stem cells?

Name Date

Cloze Activity
Section 5.2

Use with textbook pages 166–178.

Types of asexual reproduction

Vocabulary	
asexual reproduction	fragmentation
binary fission	grafts
budding	spore formation
clone	stem cells
cuttings	vegetative reproduction
DNA	

Use the terms in the vocabulary box to fill in the blanks. You can use each term more than once. You will not need to use every term.

1. A _____ is an identical genetic copy of its parent.

2. In _____, only one parent is required to produce offspring.

3. _____ is a method of reproduction for some types of bacteria.

4. Some simple organisms, such as hydras and sponges, are able to reproduce asexually by _____.

5. Certain species of sea stars, corals, and mosses can reproduce asexually by _____.

6. _____ occurs when special cells in the stems and roots divide repeatedly to form structures that eventually develop into a plant identical to the parent.

7. Some bacteria can reproduce asexually when their single cells split in two, forming new individuals in a process called _____.

8. Human-assisted cloning can be used to save the _____ of an organism or mass produce an organism with a desired trait.

9. _____ are cells that have the potential to become many different types of cells.

Use with textbook pages 168–175.

What are the five different types of asexual reproduction?

List the five types of asexual reproduction in the blanks below. Make a drawing to illustrate each type of asexual reproduction.

1. _____	**2.** _____
3. _____	**4.** _____
5. _____	

Use with textbook pages 177–178.

True or false?

Read the statements given below. If the statement is true, write "T" on the line in front of the statement. If it is false, write "F" and then rewrite the statement to make it true.

1. _____ Asexual reproduction is the formation of a new individual that has different genetic information from its parent.

2. _____ Asexual reproduction occurs in multicellular organisms such as bacteria and in one-celled organisms such as plants.

3. _____ Sometimes humans help other organisms reproduce asexually in order to preserve the DNA of an organism.

4. _____ Sometimes humans help other organisms reproduce asexually to make large numbers of a particular type of organism that has a useful trait.

5. _____ Growing new plants from the cut ends of flowers is one way that humans make clones of plants.

6. _____ Making clones of animals involves taking the nucleus from one type of cell and putting it in the nucleus of another type of cell.

Use with textbook pages 166–178.

Asexual reproduction

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Term	Descriptor
1. _____ asexual reproduction	**A.** reproductive cells that develop into new individuals by repeated mitosis
2. _____ binary fission	**B.** a group of rapidly dividing cells develops on an organism and breaks away to become a new organism
3. _____ budding	**C.** a form of asexual reproduction in which each fragment of an organism develops into a clone of its parent
4. _____ clone	**D.** single parent cell splits into two equal parts that have the same copies of genetic material
5. _____ fragmentation	**E.** an identical genetic copy of an organism's parent
6. _____ spores	**F.** only found in human embryos
7. _____ vegetative reproduction	**G.** reproduction that requires only one parent
	H. root cells divide repeatedly to form structures that develop into a plant that is identical to the parent

Circle the letter of the best answer.

8. Asexual reproduction requires

A. only one parent to produce offspring

B. two parents to produce offspring

C. a combination of parents to produce offspring

D. two clones to produce offspring

9. Bacteria reproduce asexually by

A. budding

B. fragmentation

C. binary fission

D. cloning

10. Stem cells have the potential to

A. divide rapidly

B. increase the amount of DNA

C. become many different types of cells

D. invade other types of cells

11. During the process of cloning, scientists

A. add more DNA to the parent cell

B. remove the nucleus from an egg cell

C. remove cytoplasm from an egg cell

D. allow the egg cells to bud

12. One of the key advantages of asexual reproduction is

A. offspring compete for food and space

B. large numbers of offspring reproduce quickly

C. extreme temperatures can wipe out entire colonies

D. offspring are genetic clones

13. One of the disadvantages of asexual reproduction is

A. species cannot survive when predators increase

B. large colonies can out-compete other organisms for nutrients and water

C. large numbers of offspring reproduce very slowly

D. extreme temperatures can wipe out entire colonies