## Asexual Reproduction

**Directions:** Write the correct term in the boxes to the right of each definition. Then unscramble the letters from the shaded boxes to spell an eighth term.

<table>
<thead>
<tr>
<th>asexual reproduction</th>
<th>budding</th>
<th>cloning</th>
<th>culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>fission</td>
<td>potential</td>
<td>regeneration</td>
<td>vegetative reproduction</td>
</tr>
</tbody>
</table>

1. cell division in prokaryotes
2. a type of asexual reproduction in which a new organism grows on the body of the parent organism
3. the process of growing living tissue in a laboratory
4. possibility
5. asexual reproduction in which a new organism grows from a piece of its parent
6. the production of offspring by one parent without meiosis and fertilization
7. asexual reproduction by plants
8. When they are unscrambled, the letters in the shaded boxes spell \[\text{______}______\], which is the process of making identical individuals.
Asexual Reproduction

A. What is asexual reproduction?
   1. In ________________, one parent organism produces offspring without meiosis and fertilization.
   2. Because the offspring of asexual reproduction inherit all their DNA from one parent, they are genetically ________________ to each other and their parent.

B. Types of Asexual Reproduction
   1. Cell division in prokaryotes is known as ________________.
   2. During fission, DNA is ________________ and the cell splits to form two identical offspring. The original cell no longer exists.
   3. Many unicellular ________________ reproduce by mitotic cell division. In this type of asexual reproduction, an organism forms two offspring through mitosis and ________________.
   4. In ________________, a new organism grows on the body of its parent by mitosis and cell division. When the bud becomes ________________, it can break from the parent and live on its own.
   5. ________________ occurs when an offspring grows from a piece of its parent.
      a. Sea stars, sea urchins, sea cucumbers, and planarians can ________________ through regeneration.
      b. Many animals can ________________ damaged or lost body parts. This is not reproduction; ________________ are not produced.
   6. ________________ is a form of asexual reproduction in which offspring grow from a part of a parent plant.
   7. ________________ is a type of asexual reproduction developed by scientists and performed in laboratories. It produces ________________ individuals from a cell or from a cluster of cells taken from a multicellular organism.
   8. Using a cloning method called ________________, plant growers and scientists can use a meristem to make a copy of a plant with desirable traits.
   9. Because all of a clone’s ________________ come from one parent, the clone is a genetic copy of its parent.
Lesson Outline continued

10. Asexual reproduction enables organisms to reproduce without a(n) _________________.

11. Asexual reproduction also enables some organisms to rapidly produce a large number of _________________.

12. Asexual reproduction produces offspring that are genetically identical to each other and to their _________________. This results in minimal genetic _________________. within a population.

13. Genetic variation is important because it can give organisms a better chance of _________________. if the environment changes.

14. Genetic changes, called _________________, can occur and then be passed to offspring; this can affect the offspring’s ability to survive.
## Asexual Reproduction

### Directions:
On each line, write the term from the word bank that correctly completes each sentence. Each term is used only once.

<table>
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<tr>
<td>genetically identical</td>
<td>mitotic cell division</td>
<td>nucleus</td>
<td>regeneration</td>
</tr>
<tr>
<td>tissue culture</td>
<td>vegetative reproduction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. In all types of [Term], one parent organism produces offspring without meiosis or fertilization.

2. When offspring inherit all of their DNA from one parent, they are [Term].

3. Cell division in prokaryotes is known as [Term].

4. Many unicellular eukaryotes reproduce by dividing into two offspring through mitosis and cell division. This form of reproduction is known as [Term].

5. In [Term], a new organism grows on the body of its parent by mitosis and cell division.

6. In animal [Term], a new animal grows from a piece of its parent.

7. A form of asexual reproduction in which offspring grow from a part of a parent plant is called [Term].

8. A type of asexual reproduction that produces identical individuals from a cell or cluster of cells taken from a multicellular organism is called [Term].

9. Some plants can be cloned from just a few cells using a technique that takes a(n) [Term].

10. Some animals have been cloned using the [Term] from a cell in one parent.
Asexual Reproduction

Directions: On the line before each statement, write T if the statement is true or F if the statement is false. If the statement is false, change the underlined word(s) to make it true. Write your changes on the lines provided.

1. Meiosis and fertilization are not a part of asexual reproduction. ____________________________

2. A hydra grows a new hydra on its body using a form of asexual reproduction called budding. ____________________________

3. Cloning produces identical individuals from a cell or cluster of cells taken from a unicellular organism. ____________________________

4. In all types of sexual reproduction, offspring are produced by one parent organism. ____________________________

5. Some animals can grow a new limb in a process called regeneration. ____________________________

6. A form of asexual reproduction in which offspring grow from a part of a parent plant is called vegetative reproduction. ____________________________

7. A disadvantage of asexual reproduction is that the organisms can reproduce without using the time and energy to find a mate. ____________________________

8. Cell division in prokaryotes is known as mitotic cell division. ____________________________

9. Some animals have been cloned using the cytoplasm from a cell in one parent. ____________________________

10. Many unicellular eukaryotes reproduce by dividing into two offspring through mitosis and cell division. This form of reproduction is known as mitotic cell division. ____________________________
Asexual Reproduction

Key Concept What is asexual reproduction, and why is it beneficial?

Directions: Respond to each statement on the lines provided.

1. Define asexual reproduction.

2. Explain why the offspring of asexual reproduction are genetically identical to each other and to their parent.

3. List six types of asexual reproduction.

4. Explain how plant cloning is useful for farmers and scientists.

5. Identify the two main advantages for organisms that reproduce asexually.
Clone from the past?

Cloning is a type of asexual reproduction that produces offspring from cells taken from a multicellular organism. Scientists have successfully cloned sheep. But can they produce a clone from an animal that died more than 23,000 years ago?

The Woolly Mammoth

In 1999, a helicopter pulled an 18-metric-ton block of ice and soil from the ground in northern Siberia. Inside that huge block were the frozen remains of a woolly mammoth. Other mammoths had been discovered before. But most were fossilized bones and tusks. This mammoth, called the Zharkov mammoth, was thought at first to be well preserved. Some of its skin, hair, and soft tissue appeared to be intact.

Scientists hoped to clone the woolly mammoth by extracting DNA from its cells. Studies have shown that mammoths have a close genetic relationship with modern elephants. So the mammoth’s DNA would be placed in the egg cell of a female elephant. The elephant would serve as a substitute mother. Eventually, she would give birth to a live woolly mammoth.

As the fossil was carefully thawed, however, scientists found that only a small fraction of its soft parts were intact. Further study showed that the same cold temperatures that preserved the fossil also severely damaged the chromosomes in the mammoth’s body cells. Extreme cold had burst the cells. There was not enough DNA to clone the mammoth.

New Hope

In 2007, scientists discovered yet another mammoth in Siberia. “It’s a lovely little baby mammoth indeed, found in perfect condition,” said Alexei Tikhonov, deputy director of the Russian Academy of Science’s Zoological Institute. “This specimen may provide unique material allowing us to ultimately decipher the genetic makeup of the mammoth.”

The baby mammoth, named Lyuba, once again raised hopes of cloning a mammoth. Dr. Ian Barnes of the University of London stated that he now believes a mammoth will be cloned in his lifetime.

Tikhonov, however, points out that whole cells are needed for cloning. He is doubtful that Lyuba’s cells, which endured freezing temperatures, are intact. Other scientists note that, even if a mammoth is cloned, its natural habitat no longer exists. They argue that it would be better to spend time and resources preserving endangered species that are now in danger of extinction.

Applying Critical-Thinking Skills

Directions: Respond to each statement below, please write your answers on a piece of notebook paper.

1. **Explain** the main obstacle to cloning the woolly mammoth.
2. **Deduce** the information that scientists might learn—other than genetic makeup—by studying the remains of an extinct animal.