

## Section 13-4 Applications of Genetic Engineering (pages 331-333)

### Key Concept

- How are transgenic organisms useful to human beings?

### Introduction (page 331)

1. How do scientists know that plants and animals share the same basic mechanisms of gene expression? \_\_\_\_\_  
\_\_\_\_\_

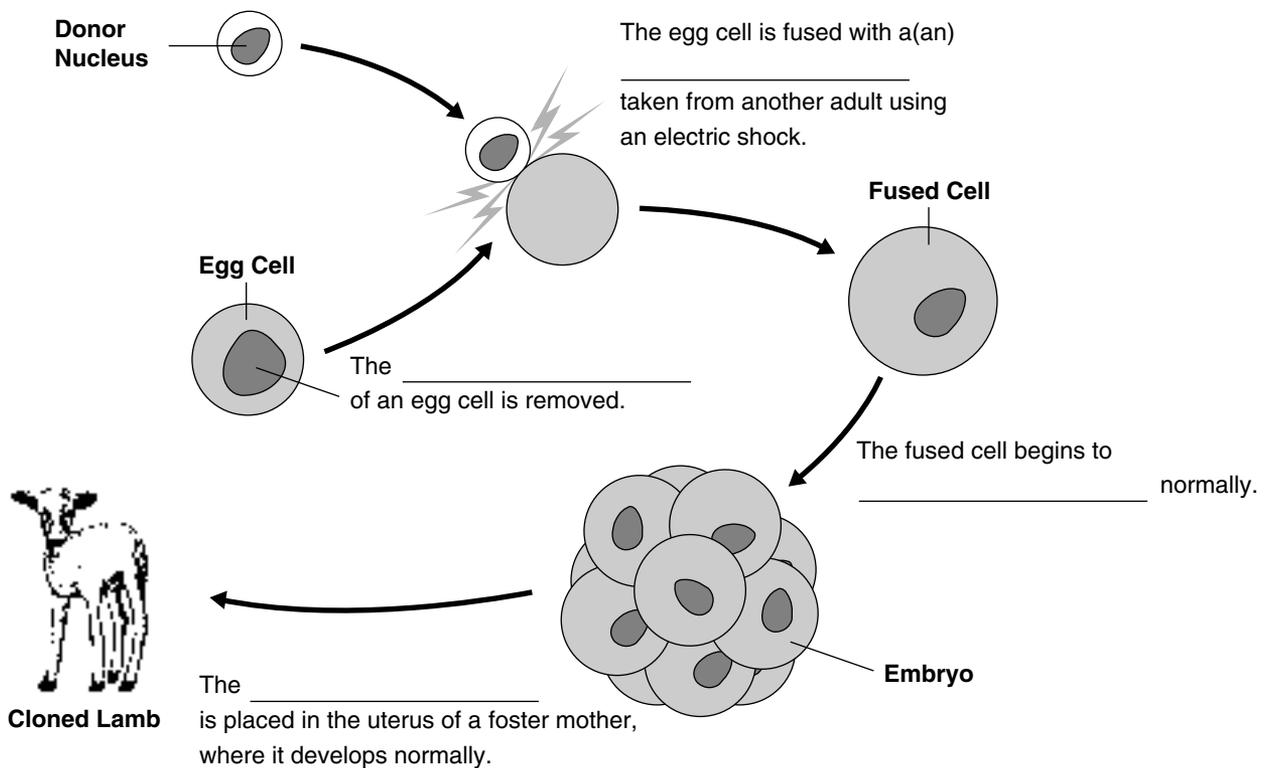
### Transgenic Organisms (pages 331-333)

2. What is a transgenic organism? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Describe how to make a transgenic organism. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Genetic engineering has spurred the growth of \_\_\_\_\_, a new industry that is changing the way we interact with the living world.
5. Circle the letter of each sentence that is true about transgenic microorganisms.
  - a. Transgenic bacteria will never produce useful substances for health and industry.
  - b. Transgenic bacteria produce human proteins cheaply and in great abundance.
  - c. People with insulin-dependent diabetes are now treated with pure human insulin.
  - d. In the future, transgenic organisms may produce the raw materials for plastics.
6. List four ways in which transgenic animals have been used.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
7. Many transgenic plants contain genes that produce a natural \_\_\_\_\_, so the crops do not have to be sprayed with pesticides.

8. Circle the letter of each item that might soon be produced by transgenic plants.
- a. human antibodies
  - b. plastics
  - c. rot-resistant foods
  - d. vitamin A-enriched rice

**Cloning (page 333)**

9. What is a clone? \_\_\_\_\_
- 
10. Is the following sentence true or false? For years, many scientists thought that it was impossible to clone bacteria. \_\_\_\_\_
11. Complete the sentences in the diagram below to show the steps in cloning a sheep.



12. Is the following sentence true or false? All cloned animals are also transgenic.
- \_\_\_\_\_

13. What kinds of mammals have been cloned in recent years? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_