



Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

SECTION  
**6.6**

MEIOSIS AND GENETIC VARIATION  
**Reading Guide**

**KEY CONCEPT**

**Independent assortment and crossing over during meiosis result in genetic diversity.**

**VOCABULARY**

crossing over

genetic linkage

**MAIN IDEA: Sexual reproduction creates unique gene combinations.**

1. What are two ways that sexual reproduction helps create and maintain genetic diversity?

\_\_\_\_\_

2. Which does sexual reproduction create, new alleles or new combinations of alleles?

\_\_\_\_\_

3. How is the production of unique genetic combinations an advantage to organisms and species?

\_\_\_\_\_

**MAIN IDEA: Crossing over during meiosis increases genetic diversity.**

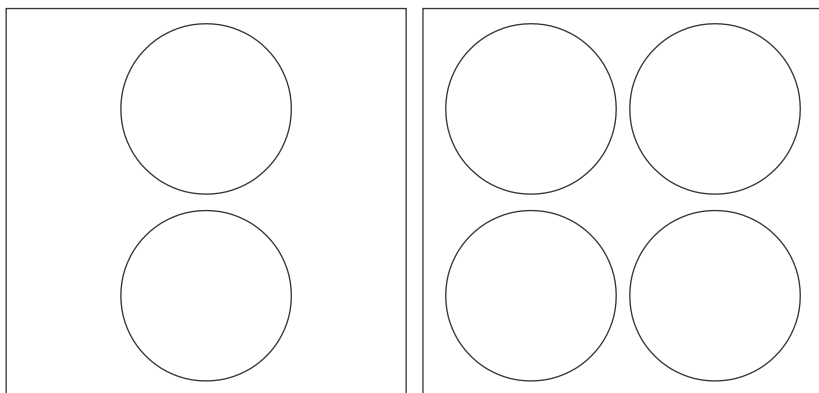
4. Are chromosomes in a duplicated or an unduplicated state when crossing over occurs?

\_\_\_\_\_

Use sketches to illustrate how crossing over contributes to genetic diversity. Use Figure 6.20 for reference. **1.** Draw a cell with four chromosomes in the first box. Make one pair of chromosomes large and the other pair small. Color in one large chromosome and one small chromosome. Leave the other two chromosomes white. **2.** In the next box, draw the cell in prophase I. Have each pair of homologous chromosomes line up together—large with large, small with small. **3.** In the third box, show crossing over between each pair of homologous chromosomes. **4.** In the last box, show what the chromosomes look like as a result of crossing over. You will use this sketch in the next exercise.

## READING GUIDE, CONTINUED

Refer to your cell sketch in the last box on the previous page. Also refer to Figure 6.5 if necessary. **1.** In the first box below, show what your cell would look like at the end of meiosis I. Remember, the result will be two cells that have one duplicated chromosome from each homologous pair. **2.** In the second box, show what your cell would look like at the end of meiosis II. Remember, the result will be four cells that have one (*unduplicated*) chromosome from each homologous pair.



5. If genes A and B are located on separate, nonhomologous chromosomes, will they follow Mendel's law of independent assortment? Explain.

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6. If genes A and B are located at opposite ends on the same chromosome, are they likely to follow Mendel's law of independent assortment? Explain.

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7. If genes A and B are located very close together on the same chromosome, are they likely to follow Mendel's law of independent assortment? Explain.

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## Vocabulary Check

8. The exchange of chromosome segments between homologous chromosomes is called

\_\_\_\_\_.

9. The tendency for two genes that are located close together on a chromosome to be inherited together is called \_\_\_\_\_.