**Study Guide**

**CHAPTER 13**

**Section 1: Applied Genetics**

In your textbook, read about selective breeding.

*Match the definition in Column A with the term in Column B.*

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. the process in which two closely related organisms are bred to produce desired traits and eliminate undesired ones in future generations</td>
<td><strong>B.</strong> selective breeding</td>
</tr>
<tr>
<td>2. the process by which desired traits in an organism are selected and passed on to their future generations</td>
<td><strong>C.</strong> inbreeding</td>
</tr>
<tr>
<td>3. the method for determining the genotype of an organism</td>
<td><strong>A.</strong> test cross</td>
</tr>
</tbody>
</table>

In your textbook, read about hybridization.

*Complete the graphic organizer about hybridization.*

**Hybridization**

4. **Definition:**

5. **Used by:**

6. **Advantages of Hybridization:**

7. **Disadvantages of Hybridization:**

In your textbook, read about inbreeding.

*Use each of the terms or phrases below only once to complete the passage.*

- **Clydesdale**
- **harmful recessive traits**
- **pure breeds**
- **recessive allele**

Inbreeding may be used to produce (8) ____________________________ . The (9) ____________________________ horse is a good example of inbreeding. One disadvantage of inbreeding is that it can lead to (10) ____________________________ . Harmful traits can be passed on to future generations if both parents carry the (11) ____________________________ .
In your textbook, read about DNA technology.

Complete the table by using each term in a sentence.

<table>
<thead>
<tr>
<th>Vocabulary Term</th>
<th>Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Genetic engineering</td>
<td></td>
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<tr>
<td>2. Restriction enzymes</td>
<td></td>
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<tr>
<td>3. Gel electrophoresis</td>
<td></td>
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<tr>
<td>4. Recombinant DNA</td>
<td></td>
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<tr>
<td>5. Plasmids</td>
<td></td>
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<tr>
<td>6. DNA ligase</td>
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<td>7. Transformation</td>
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<td>8. Cloning</td>
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<tr>
<td>9. Polymerase chain reaction</td>
<td></td>
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<tr>
<td>10. Transgenic organisms</td>
<td></td>
</tr>
</tbody>
</table>

In your textbook, read about genetic engineering.

Use each of the terms or phrases below only once to complete the passage.

- desired traits
- expressed
- gene

Selective breeding produces organisms with (11) ________________ desired traits__, while genetic engineering actually changes how a specific (12) ________________ gene__ is expressed in an organism's offspring.
In your textbook, read about DNA tools and recombinant DNA.

Complete the graphic organizer about recombinant DNA.

Write the term or phrase that best completes each statement. Use these choices:

- gel electrophoresis
- PCR
- recombinant DNA technology
- restriction enzymes

16. Scientists use ___________________________ to cut DNA into smaller fragments.

17. A process called ___________________________ separates DNA fragments by size.

18. During ___________________________ , DNA fragments move to the positive end.

19. ___________________________ starts with a primer.

20. ___________________________ are bacterial proteins.

21. ___________________________ combines DNA fragments from different sources.

22. A technique called ___________________________ copies a specific region of DNA.
In your textbook, read about the Human Genome Project.

Use each of the terms or phrases below only once to complete the passage.

- cleaved DNA fingerprinting
- Human Genome Project
- noncoding sequences
- Escherichia coli
- nucleotides
- protein-coding sequences

The (1) Human Genome Project was completed in 2003. Its goal was to determine the sequence of all the (2) protein-coding sequences of human DNA. Scientists prepared for the HGP by starting small, using (3) Escherichia coli. To determine one continuous human genome sequence, each of the 46 human chromosomes was (4) cleaved. Most of the sequences have no direct function and are called (5) noncoding sequences, while less than 2 percent of the sequences are (6) nucleotides. The DNA sequences unique to each individual were determined through (7) DNA fingerprinting.

In your textbook, read about DNA fingerprinting.

Imagine that you are a detective trying to solve a crime that occurred ten years ago. You have DNA from the crime scene. Write a summary of how you might use DNA fingerprinting to solve your mystery.

8. ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________

In your textbook, read about the genome and genetic disorders.

Complete the graphic organizer about SNP.

9. Definition: ____________________________________
   ____________________________________________

10. Function: ____________________________________
    ___________________________________________