**Should This Dog Be Called Spot?**

Imagine this microscopic drama. A sperm cell from a male dog fuses with an egg cell from a female dog. Each dog’s gamete carries **39 chromosomes**. The zygote that results from the fusion of the gametes contains **78 chromosomes** - one set of 39 chromosomes from each parent. One pair of the zygote’s chromosomes are shown below.

Each chromosome of the homologous pair contains alleles for the same traits. But one chromosome may have a dominant allele and the other a recessive allele. Use the drawings and the table to answer the questions.

<table>
<thead>
<tr>
<th>Trait</th>
<th>Dominant Gene</th>
<th>Recessive Gene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair Length</td>
<td>Short (L)</td>
<td>Long (l)</td>
</tr>
<tr>
<td>Hair texture</td>
<td>Wiry (T)</td>
<td>Silky (t)</td>
</tr>
<tr>
<td>Hair curliness</td>
<td>Curly (H)</td>
<td>Straight (h)</td>
</tr>
<tr>
<td>Coat pattern</td>
<td>Spotted (A)</td>
<td>Solid (a)</td>
</tr>
</tbody>
</table>

1. Will the new puppy have a spotted coat? Explain.

2. Does the female dog have a spotted coat? Explain.

3. Does the male dog have a spotted coat? Explain.

4. What will the texture of the puppy’s coat? Explain.
5. Will the texture of the puppy’s coat resemble that of either of its parents? Explain.

6. Will the puppy have curly hair or straight hair?

7. a. Does the female dog have curly hair?

   b. Does the male dog have curly hair?

8. a. Define the term heterozygous.

   b. For which traits is the puppy heterozygous?

9. a. Define the term homozygous.

   b. For which traits is the puppy homozygous?

10. Explain why you cannot completely describe the puppy’s parents even though you can accurately describe the puppy.

Cat’s have 32 chromosomes in their cells.

11. How many chromosomes would you expect to find in the egg and sperm of cats? __________

12. In one cat, do all the cell’s contain the exact same chromosomes? Explain.