1. Describe what is happening in figures 1-3. Is the population of mice different in figure 3 than in figure 1? Explain why.

   The bird is eating all the white mice because they are easier to see.

2. Living things that are well adapted to their environment survive and reproduce. Those that are not well adapted don’t survive and reproduce. An adaptation is any characteristic that increases fitness, which is defined as the ability to survive and reproduce.

   What characteristic of the mice in figure 1 was an adaptation that increased fitness?

   the grey color (camouflage)

3. The table describes four female mice that live in a beach area which is mostly tan colored sand with scattered plants.

<table>
<thead>
<tr>
<th>Characteristics of each female mouse</th>
<th>Black</th>
<th>Tan</th>
<th>Tan and Black</th>
<th>Cream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running speed</td>
<td>8 cm/sec.</td>
<td>6 cm/sec.</td>
<td>7 cm/sec.</td>
<td>5 cm/sec.</td>
</tr>
<tr>
<td># pups produced by each female</td>
<td>0</td>
<td>11</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Age at death</td>
<td>2 months</td>
<td>8 months</td>
<td>4 months</td>
<td>2 months</td>
</tr>
</tbody>
</table>

According to the definition given for fitness, which mouse would biologists consider the fittest? Explain why this mouse would be the fittest.

   The tan colored mice because they produced the most pups & lived the longest.
Part 2

READ THIS...

If a mouse's fur color is generally similar to its mother's color, what color fur would be the most common among the pups?

A heritable characteristic is influenced by genes and passed from parents to offspring. In the mice on the tan sand, tan fur was a heritable adaptive characteristic, and you saw how this characteristic became more common in the pups than in the mothers. In nature, heritable adaptive characteristics become more common in a population over many generations. This process is called evolution by natural selection.

Evolution by natural selection leads to adaptation within a population. The term evolution by natural selection does not refer to individuals changing, only to changes in the frequency of adaptive characteristics in the population as a whole. For example, for the mice that lived on tan sand, none of the mice had a change in the color of their fur; rather, due to natural selection, tan fur was more common for the pups than for the mother mice.

In summary, a heritable characteristic that helps an animal or plant to have more offspring which survive to reproduce will tend to become more common in a population as a result of evolution by natural selection.

Answer these...

1. Explain why a heritable characteristic which helps an animal to live longer will generally tend to become more common in the population as a result of evolution by natural selection.

   This is because the animals with the favorable condition will be able to live longer and reproduce more, therefore passing down their trait.

2. Suppose a different heritable characteristic helped animals to live longer but made them sterile so they could not have any offspring. Explain why this heritable characteristic would not become more common as a result of evolution by natural selection.

   This trait would not be passed down as the animals could not reproduce.