Introduction to Fibers Practice

Use the words in the word box to complete the following sentences.

<table>
<thead>
<tr>
<th>plants</th>
<th>individual</th>
<th>length</th>
</tr>
</thead>
<tbody>
<tr>
<td>unique</td>
<td>fiber</td>
<td>sheep</td>
</tr>
<tr>
<td>man-made</td>
<td>animals</td>
<td>increases</td>
</tr>
<tr>
<td>cotton</td>
<td>common</td>
<td>yarn</td>
</tr>
<tr>
<td>diameter</td>
<td>wool</td>
<td>synthetic</td>
</tr>
</tbody>
</table>

1. The _____ fiber_____ is the smallest unit of textile material that has a _____ length____ many times greater than its _____ diameter____. A fiber can be spun with other fibers to form a _____ yarn____ that can be woven or knitted to form a fabric.

2. Matching _____ unique____ fibers on the clothing of a victim to fibers on a suspect’s clothing can be very helpful to an investigation, whereas the matching of _____ common____ fibers such as white cotton or blue denim fibers would be less helpful.

3. The discovery of _____ individual____ and multiple fiber transfers between the suspect’s clothing and the victim’s clothing dramatically _____ increases_____ the likelihood that these two individuals had physical contact.

4. For centuries, humans were dependent on natural sources for textile fibers derived from _____ plants____ and _____ animals____.

5. _____ Cotton_____ fibers are the plant fibers most commonly used in textile materials.

6. The animal fiber most frequently used in the production of textile materials is _____ wool____, and the most common of these originate from _____ sheep____.

7. More than half of all fibers used in the production of textile materials are synthetic or _____ man-made____.

8. Nylon, rayon, and polyester are all examples of _____ synthetic____ fibers.

Answer the following questions in complete sentences.

9. How would you be able to tell a natural fiber apart from a synthetic fiber when looking at it under the microscope?
   A natural fiber has many twists will a synthetic fiber is smooth. If the natural fiber comes from hair, it could have the characteristics of hairs like a visible cuticle or medulla.

10. Label the following fibers as natural or synthetic and give a brief explanation about why you identified it the way you did.

   ![Natural-has a twist](image1)
   ![Synthetic-smooth](image2)
   ![Synthetic-smooth](image3)
11. Identify the weave pattern in the following fabrics.

Satin  Twill  Plain

12. Where could fibers be found in a hit and run?
   On the area of the vehicle that hit the person. For example, on the bumper, in the cracks where two body pieces meet, in the space between the car and door, etc.

13. Where could fibers be found in a break-and-entering attempt?
   On the broken glass or wood from a splintered door. Windowsill, door frame, door handle, etc.

14. Explain the usefulness of white cotton fiber found at a crime scene.
   A white cotton fiber found at a crime scene is not useful at all because it is the most common type of man-made fiber and could come from ANY source. It does not prove a suspect was in contact with a victim.

15. How would you be able to tell the difference between a hair and a fiber? What would you look for underneath the microscope?
   To determine the difference between a hair and fiber, look first for characteristics of hair, such as a cuticle, medulla, and pigment granules. Fibers will be either uniform and smooth, or twisted together.