Reach Out and Touch Someone

Shut your eyes. What can you feel? Touch, pressure, heat, or cold? All these sensations are your brain's interpretation of signals it receives from your skin. Here's a simple exploration you can do to measure your sense of touch.

**Specialized cells** perform specialized functions in multicellular organisms. Groups of specialized cells cooperate to form a tissue, such as a muscle. Different tissues are, in turn, grouped together to form larger functional units, called organs. Each type of cell, tissue, and organ has a distant structure and set of functions that serve the organism as a whole.

**Multicellular animals** have nervous systems that generate behavior. Nervous systems are formed from specialized cells that conduct signals rapidly through the long cell extensions that make up nerves. The nerve cells communicate with each other by sending out molecules. In sense organs, specialized cells detect light, sound, and specific chemicals and enable animals to monitor what is going on in the world about them.

**Behavior** is one kind of response an organism can make to an internal or environmental stimulus. A behavioral response requires coordination and communication at many levels, including cells, organ systems, and whole organisms. Behavioral response is a set of actions determined in part by heredity and in part from experience.

**What You'll Need:**
- The ends of two paper clips that you've partially opened
- A millimeter ruler
- Eye protection

**Procedure:**

Find a partner. Ask your partner to shut his or her eyes. Then very gently place two points on the skin on the back of your partner's hands, 5 mm apart. Ask: "Can you feel two points or one?" (Most students will be able to tell that there are two points.)

Next, try to find the minimum distance that a student can distinguish two points instead of one. Do this by trying to place your points 4 mm apart, then 3 mm, 2 mm, and 1 mm from each other. Record your subject's response on the table below.

Next try the same experiment on the top and bottom of the forearm. Is there a difference?
Can You Feel Two Points or One?

Write 2 or 1 in the data table based on how many points you feel.

<table>
<thead>
<tr>
<th>Part of Body:</th>
<th>Back of Hand</th>
<th>Top of Forearm</th>
<th>Bottom of Forearm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance between points:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 mm</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4 mm</td>
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<td></td>
<td></td>
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<td>3 mm</td>
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<td></td>
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<td>2 mm</td>
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<tr>
<td>1 mm</td>
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</tr>
</tbody>
</table>

Questions:

1. In which area of the skin are touch receptors closest?

2. How could having touch receptors help us survive?

3. Is there any part of the body where touch receptors would be a disadvantage?