

Investigation 12.C: Feel, Taste, or Smell: Design Your Own Investigation

Question: How can you design an investigation to show how a particular sense, or a combination of senses, can distinguish various sensations?

Safety Precautions

- Do not bring food meant for consumption into the laboratory.
- Do not eat or drink anything in the laboratory.

Topic 1: Feel Those Sensations

Design an investigation to distinguish the different sensory receptors found in the skin, including the receptors for touch, pressure, pain, heat, and cold.

Suggested Materials

- 500 mL beaker of hot water (60 °C)
- 500 mL beaker of ice water (0–2 °C)
- non-permanent pen for marking gridlines on the body
- alcohol thermometer
- finishing nails

Topic 2: Tantalize Those Taste Buds

Design an investigation to distinguish the four basic tastes (sweet, salty, sour, and bitter) using the tongue. Also investigate the relationship between smell and taste. **Note:** You must conduct this investigation at home or in the school cafeteria, *not* in the laboratory.

Suggested Materials

- salty water
- sugary water or candy
- onion juice or tonic water
- clean toothpicks or cotton swabs
- lemon juice
- garbage bin
- blindfold

Topic 3: Expose Your Nose

Design an investigation to determine the ability of the olfactory receptors to distinguish various smells.

Suggested Materials

- ginger
- lemon
- menthol
- peppermint
- perfume
- blindfold
- pine needles
- vanilla
- vinegar

Experimental Plan

1. As a group, record the question(s) that you plan to investigate.
2. Write a hypothesis related to your experimental question(s).
3. Using the suggested materials as a starting point, develop a procedure to investigate your topic. List the manipulated, responding, and controlled variables. Note what you can use as a control test or trial (point of reference for your experimental trials).

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HANDOUT		

4. Decide how your group will make the appropriate measurements, how many samples you will use, and whether you will pool your data with other groups' data. Design a table to record your data.
5. After obtaining approval from your teacher for your experimental design, conduct your investigation.

Data and Observations

Record your data. When you have completed your investigation, present your experimental design and results to the rest of the class. Include a diagram that shows the neural pathway from the sensory receptors to the area of the brain where perception occurs.

Analysis

1. Describe any unexpected results. Hypothesize if and how your results would have been different if you had tested a combination of senses.

2. How could you improve your experimental design?

Conclusion

3. How are the sensory receptors organized so that we can distinguish different strengths and types of touch, taste, and smell?