Mini Lab: Comparing Paper Towels

**Objective:** Apply scientific method to determine which paper towel can hold the most water.

**Anchor(s) Addressed:**
- S8.A.1.1.2 Explain how certain questions can be answered through scientific inquiry and/or technological design.
- S8.A.1.1.3 Use evidence, such as observations or experimental results to support inferences about a relationship.
- S8.A.2.1 Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems.

**Materials:**
- Paper Towel A, B, C, D, eye dropper.

**Scenario:**
Mrs. Everhart is tired of buying paper towels that fall apart when she tries to wipe up the water that her dog Meatball drips on the floor after he drinks. She would like to know what paper towel can hold the most water and therefore save her money by using less paper towels. Are you able to help her solve this problem?

**Assignment:**
Use the scientific method to answer the question: Does paper towel A, B, C or D hold the most water? Record all of your responses in the lab.

**Procedure:**
1. Get in your lab groups and obtain all materials.
2. Record the question to be answered on your Student Activity Worksheet.
3. As a group, form a hypothesis to the question (remember, a hypothesis includes a predicted answer AND an explanation for that predicted answer in If...then format). Record your hypothesis on the Student Activity Worksheet.
4. Test your hypothesis by completing the following experiment:
   a. Lay all four paper towel squares down on lab table.
   b. Add one drop of water to each square.
   c. Continue to add drops until the piece of paper towel no long can absorb the water. (You will know the paper towel can no longer hold the water because the water will be sitting on the table.)
   d. Tally your observations in a frequency table and graph your results.
   e. Repeat steps a-d three more times.
5. Calculate and record the average water drops held for each paper towel. Use the following formula:
   \[
   \frac{\text{Sum of Drops for Brand A}}{4} \\
   \frac{\text{Sum of Drops for Brand B}}{4} \\
   \frac{\text{Sum of Drops for Brand C}}{4} \\
   \frac{\text{Sum of Drops for Brand D}}{4}
   \]

6. Construct a **bar graph** that compares the average number of drops held for each paper towel. Use colored pencils, a ruler & the following information:
   a. Graph Title: Paper towel brand versus Average drops of water held
   b. X-axis Label: Paper Towel Brand
   c. Y-axis label: Average drops of water held

7. Complete the Analysis
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Student Activity Worksheet

Question:
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

Hypothesis:
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

Data:

| Paper Towel Absorbency (Drops of Water Per Sheet) |
|------------------|------------------|------------------|------------------|------------------|
| Trial            | Brand A          | Brand B          | Brand C          | Brand D          |
|                  |                  |                  |                  |                  |
|                  |                  |                  |                  |                  |
|                  |                  |                  |                  |                  |
| Average number of drops held | | | | |
Analysis:

1. Was your hypothesis supported or refuted? Why or why not?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

2. Did all the squares of paper towels absorb equal amounts of water?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

3. Which scientific methods did you use to compare paper towel absorbency?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

4. List the 6 steps of the scientific method in order.
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

5. Explain the two parts of a hypothesis.
   __________________________________________________________
   __________________________________________________________