How many drops of H_2O can fit on a penny?

Name: _____ Class Hour: _____ Date: _____

Directions: Today you will utilize the steps of the scientific method to solve a scientific problem dealing with the concepts of cohesion and surface tension.

1. Identify the Problem: (Note: This step is done for you.)

Does the test liquid allow a penny to hold more drops of water?

2. Form a Hypothesis: (Circle your Hypothesis and Explain)

Yes   No

                    Explain:

3. Create an Experiment: (Practice Identifying Parts)

Part A: Perform a Control experiment. The penny has not been dipped in the test liquid.

        Step 1: Start with a "clean" penny. Rinse a penny in tap water and dry completely.

        Step 2: Place the penny on paper towel.

        Step 3: Use an eye dropper to place drops of WATER on the penny (one at a time) until ANY amount of water runs over the edge of the penny. **Control other variables!**

        Step 4: Record the number of drops for each trial on the table below.

                * Repeat Steps 1 - 3 three more times before calculating your average.

How Many Drops? (Control)	Trial 1	Trial 2	Trial 3	Average

Part B: Perform a Test experiment. The penny has been dipped in the test liquid.

        Step 1: Start with a "clean" penny. Rinse the penny in tap water and dry completely. Be sure to remove as much residue as possible - without using soap!

        Step 2: Hold the penny with the tweezers provided, and dip it into the **TEST LIQUID for 5 seconds.** Allow extra liquid to drip off the penny into the container before proceeding to the next step.

        Step 3: Place penny on dry spot on a paper towel. Place drops of **WATER** on the penny (one at a time) until ANY amount of water runs over the edge of the penny. **Control other variables!**

        Step 4: Record your observations and the number of drops for that trial on the table below.

                * Repeat Steps 1 - 3 three more times before calculating the average.

How Many Drops? (Test)	Trial 1	Trial 2	Trial 3	Average

4. Analyze the Data

Is the data collected during each experiment reliable? Explain.

How do your results compare to the other groups in your class? (Use Data Table Below)

Control Experiment

How Many Drops?	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Class Average

Test Experiment

How Many Drops?	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Class Average

Scientists and others often use graphs when analyzing the data yielded from an experiment to make sense of it. What kind of graph could you utilize that would show a comparison of the CLASS AVERAGE (only) results of the <u>control</u> and <u>test</u> experiments? Please circle below your choice of graph and then design one to show the results. Staple your completed graph as a separate sheet of paper attached to this handout.
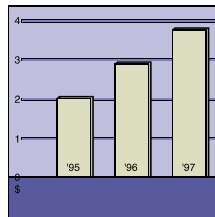
Communicate the Results (State a conclusion.)

Write a conclusion that summarizes the important parts of your experiment and the results.

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