**DO NOT WRITE ON THIS FORM**

**Dish Soap Market Testing Lab - PROCEDURE**

Scientific Method Activity

**Objectives/Purpose** Students will:

1. Perform steps of the scientific method to determine what dish soaps yield the largest and smallest bubbles.
2. Form hypotheses, determine variables (constants, dependent, independent) and test their hypothesis with an experiment
3. Practice performing calculations, gather/organize and analyze data, and write a conclusion supported by data from the experiment.

**Safety Concerns:** Soap can be irritating. If you touch the soap solution, keep hands away from your eyes and mouth.

**Materials:**

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| * 3 brands dish soap – see data table for names (suggest 3 soaps of different colors)
* Containers of each brand diluted: 1/4c. soap + 4c. water
* Set up 2 stations of each soap type, so there is only 1 type of soap/table to lessen the number of soap containers and decrease the need to clean & dry the table between bubbles – less chance of contamination/mixing of types of soap
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| * Several paper towels/group
* Straws for each student
* Ruler & Meter Stick
* Tablespoon
 | * Rag (to dry table)
* Calculator
* Wastebasket by each table
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**Procedure:**

* NOTE: You will be rotating tables. Stay at your current table until INSTRUCTED to move.
* **Before you begin** the actual experiment, each person should attempt to blow a bubble.

(This will decrease human error from the calculations you will make later.)

* 1. Practice using the same steps that will be used in the actual experiment – the steps that follow. Whatever solution you use first, will be your “practice” solution.
	2. You do NOT need to measure the practice bubbles.
	3. Once each person blows a bubble, begin the actual testing. (There is no need to dry the table between bubbles IF the same brand of soap is being used.)

**STEPS For Practice& Actual Testing**

1. **Dampen** the table, if it is not damp already, by putting 2 tablespoons of the soap mixture on the desk & smear it around.
2. **Place** 2 Tablespoons of the soap and water solution on the lab table. \*\*NOTE: Add another 2 tablespoons before EVERY bubble. Note the dish soap solution brand you are using.
	1. Suggestion: put the solution near the edge of the table and blow the bubble towards the center of the table.
3. Begin **blowing one bubble slowly** until it bursts. SUGGESTIONS that may help:
	1. Start with straw perpendicular/straight up from the table.
	2. Once a bubble forms, tilt your straw slightly and continue to blow slowly.
	3. If you need to take another breath, hold your tongue over the hole of the straw.
	4. NOTE: If you blow the bubble too fast, you may create multiple bubbles rather than the one bubble you want.
4. Use the **ruler** to measure the **inside diameter** of the clear ring left after the bubble pops. (Do NOT measure the bubbles around the outside of the ring.) Measure in **centimeters (cm) to the nearest decimal.** Record this number in your data table.
5. Repeat steps 1-4 until you have **THREE** measurements with this soap solution.
	1. Each person should blow a bubble.
	2. If there are less than 3 people in your group, the same person should blow the extra bubbles with each different solution .
	3. WHY? (Keep the testing constant)
6. **Calculate the average** bubble diameter for the solution in **centimeters to the nearest decimal**.
7. **Wipe up** the soap and water mixture on the desk with a provided rag before your group moves to the next table.
8. **Repeat Steps 1-7** for each brand of soap solution. (There are 3 brands, each on a separate lab table.)
9. After you have tested all 3 brands, **clean up** the last table you are at; dry the table, throw your straws away, put rulers and calculators in a neat pile.