DROPS ON A PENNY

NAME

CLASS / DATE

01 QUESTION

How does adding dish soap to water change how many drops a penny can hold?

02 PREDICT BEFORE YOU MEASURE

WHICH LIQUID MAY HOLD MORE DROPS ON THE PENNY?

○ plain water ○ water with dish soap ○ about the same ○ not sure yet

Predict before counting. Use the same penny and dropper method for both liquids.

03 VARIABLES

I CHANGE (INDEPENDENT)	I MEASURE (DEPENDENT)

I KEEP THE SAME (CONTROLLED) · CHANGED: LIQUID (PLAIN OR WITH 1 DROP OF SOAP). MEASURED: WHOLE DROPS AT FIRST SPILL. KEEP THE COIN CLEAN AND DRY, LEVEL, AND USE THE SAME DROPPER HEIGHT.

04 MATERIALS

- ☐ Clean penny and flat tray
- ☐ Dropper and plain water
- ☐ Water with 1 drop of dish soap
- ☐ Paper towels to dry coin between trials
- ☐ Calculator and recording sheet

05 PROCEDURE

SAFETY Use a clean penny and keep coins away from mouths and younger children because they are small parts. Do not drink water after dish soap is added. Keep soapy water away from eyes. Work over a tray and wipe drips promptly so the surface does not become slippery.

1 **SET A FAIR METHOD** Place a clean penny flat on a level tray. Choose a consistent dropper height and angle and keep them the same. ☐

2 **TEST PLAIN WATER** Add one drop at a time until water first spills over the edge. Record the whole-number count. ☐

3 **DRY AND REPEAT** Dry the penny completely and repeat until you have three plain-water trials. ☐

4 **TEST SOAPY WATER** Repeat three times using water with 1 drop of dish soap. Dry the penny fully between each trial. ☐

5 **AVERAGE AND COMPARE** Find each three-trial mean. Do not drink soapy water; wipe drips and wash hands. ☐

DATA AND EXPLANATION

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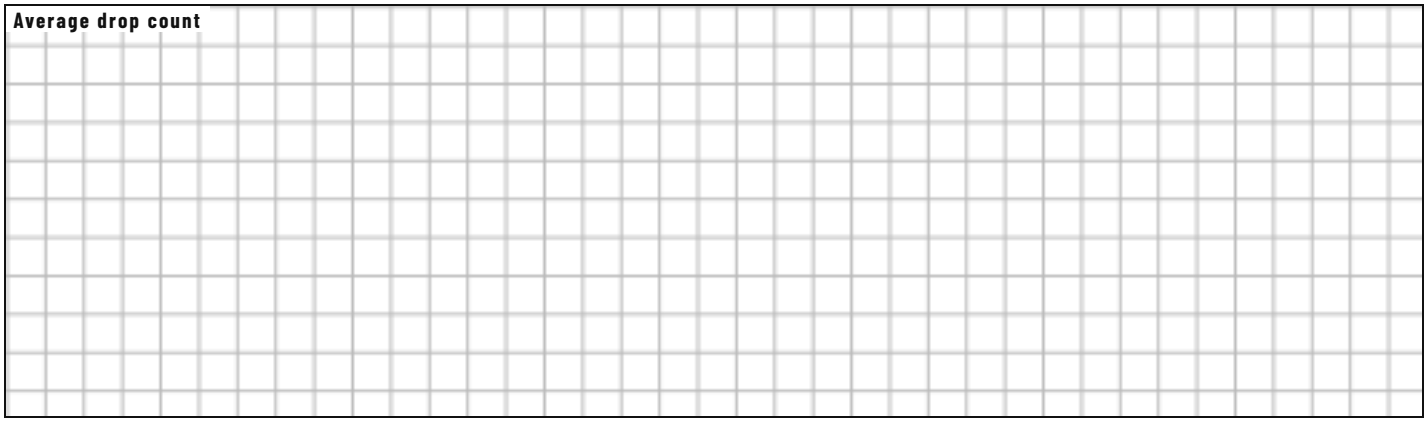
06 RECORD YOUR OBSERVATIONS

LIQUID	TRIAL 1	TRIAL 2	TRIAL 3	AVERAGE
Plain water				
Water + dish soap				

Average = (Trial 1 + Trial 2 + Trial 3) ÷ 3. Count the drop that first spills consistently as the endpoint for every trial.

SHOW ONE CALCULATION

07 AVERAGE DROPS HELD BY LIQUID



Plot one average for each liquid. Drop counts cannot be negative, so begin the vertical scale at zero.X: Liquid

08 EXPLAIN IT WITH EVIDENCE

CLAIM

EVIDENCE

REASONING

Reasoning must use: liquid · same clean penny · drop count · average · surface tension

09 THINK FURTHER

How might changing dropper height affect drop size and the number counted before spilling?