DENSITY COLUMN

NAME

CLASS / DATE

01 QUESTION

Where will an object settle in a column of liquids stacked by density?

02 PREDICT BEFORE YOU MEASURE

AN OBJECT WILL SETTLE WHERE…

○ a liquid below can support it ○ it reaches the bottom ○ I need the column result first

Predict the layer or boundary before testing each object; use the actual settled column, not a fixed recipe.

03 VARIABLES

I CHANGE (INDEPENDENT)	I MEASURE (DEPENDENT)

I KEEP THE SAME (CONTROLLED) · OBJECT TESTED CHANGES; RECORD ITS PREDICTED AND ACTUAL LAYER. KEEP THE FOUR LIQUIDS, COLUMN AND CAREFUL ENTRY METHOD CONSISTENT.

04 MATERIALS

- ☐ Clear cylinder on a tray
- ☐ Syrup, dish soap, colored water and oil
- ☐ Dry grape, cap, eraser and bead
- ☐ Spoon or pipette, labels and towel

05 PROCEDURE

SAFETY Even if the starting liquids are kitchen products, the mixed column is a lab sample: do not drink or taste it. Check ingredients for allergies before setup. Use a stable, unchipped container on a tray. Wipe spills promptly; syrup and oil can make floors slippery.

1. **LAYER SLOWLY** Add syrup, dish soap, colored water and oil down the cylinder wall or over a spoon. Let the layers settle. ☐
2. **RECORD ACTUAL ORDER** Label the observed top-to-bottom order; products may not form exactly the same layers every time. ☐
3. **PREDICT** For each dry object, mark a predicted layer or boundary before placing it in the column. ☐
4. **TEST GENTLY** Lower one object at a time; watch where it stops and record the actual layer or boundary. ☐
5. **COMPARE** Mark whether each prediction matched and explain one position using neighboring liquid layers. ☐

DATA AND EXPLANATION

NAME

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06 RECORD YOUR OBSERVATIONS

OBJECT	PREDICTED LAYER	ACTUAL LAYER	MATCHED?
Grape			
Bottle cap			
Eraser			
Plastic bead			

A boundary can bracket an object's average density; this qualitative column does not give an exact number.

07 SKETCH THE SETTLED DENSITY COLUMN

Draw and label the actual liquid layers from top to bottom. Add each object where it stopped and mark the boundaries.

08 EXPLAIN IT WITH EVIDENCE

CLAIM

EVIDENCE

REASONING

Reasoning must use: liquid layer · boundary · object · density · prediction

09 THINK FURTHER

What mass and volume measurements would you need to estimate one liquid's density directly?