OOBLECK NON-NEWTONIAN FLUID LAB

NAME

CLASS / DATE

01 QUESTION

How does cornstarch-to-water ratio relate to a marble's sink depth after five seconds?

02 PREDICT BEFORE YOU MEASURE

HOW MAY CORNSTARCH AMOUNT AFFECT MARBLE SINKING?

○ sink more slowly ○ sink at a similar rate ○ show no clear pattern yet

Predict before testing. Mixture amount, stirring and placement can affect the measured sink depth; note when the marble reaches the bottom.

03 VARIABLES

I CHANGE (INDEPENDENT)	I MEASURE (DEPENDENT)

I KEEP THE SAME (CONTROLLED) · CHANGED: CORNSTARCH-TO-WATER VOLUME RATIO. MEASURED: THREE MARBLE DEPTHS AT 5 SECONDS PER BATCH, THEIR MEAN/RANGE, AND A SEPARATE TAP NOTE. KEEP SETUP MATCHED AND RECORD ANY BOTTOM LIMIT.

04 MATERIALS

☐ Three measured recipes: 75 + 75 mL, 90 + 60 mL, and 100 + 50 mL

☐ Three matching wide shallow trays

☐ Same clean marble, millimeter ruler and 5-second timer

☐ Spoons, labels, covered table and recording sheet

☐ Scraper and waste container for drying; never use a sink drain

05 PROCEDURE

SAFETY Do not eat or breathe dry starch. Mix gently over a covered tray and wash hands. Never drain oobleck; let it dry and put it in trash. Wipe spills to prevent slips.

1 **LABEL AND MEASURE** Measure 75 + 75 mL, 90 + 60 mL and 100 + 50 mL of cornstarch and water for the three labeled ratios. ☐

2 **MIX EACH BATCH** Use matching containers and stir each batch for the same time until no dry pockets remain. ☐

3 **RECORD THREE SPOT READINGS** Use the same clean marble in three separate untouched spots per batch. At 5 seconds, measure from the original surface to the marble's lowest point in millimeters. ☐

4 **CALCULATE AND MAKE A SEPARATE TAP NOTE** Keep every reading and calculate the mean and range. Use a separate spot for one quick tap; this observation is not a measured force. ☐

5 **COMPARE AND DISPOSE** Compare means and ranges; these spots share one recipe batch. Scrape it into waste to dry, never into a drain. ☐

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DATA AND EXPLANATION

06 RECORD YOUR OBSERVATIONS

RATIO	SPOT 1 (MM)	SPOT 2 (MM)	SPOT 3 (MM)	MEAN / RANGE (MM)	QUICK TAP NOTE
1 : 1					
1.5 : 1					
2 : 1					

At exactly 5 seconds, measure down from the original mixture surface to the marble's lowest point. Mean = sum ÷ 3; range = highest − lowest. Mark a bottom-limited reading. The three spots share one batch.

07 COMPARE SLOW AND FAST FORCE

Draw the marble after gentle placement and show the surface after one quick tap. Label the mixture ratio and describe each response.

08 EXPLAIN IT WITH EVIDENCE

CLAIM

EVIDENCE

REASONING

Reasoning must use: cornstarch-to-water ratio · marble · 5 seconds · depth · quick tap

09 THINK FURTHER

How could you test the effect of tap speed while keeping mixture ratio and amount constant?