Experiment 626: What Makes Stitch Strong?

(Density & Buoyancy)

Introduction

My favorite movie is Lilo and Stitch, and I learned that Stitch sinks because he is very dense. Density means how much mass is packed into an object. After watching the movie, I became curious about how density affects whether objects sink or float in water. This inspired me to design an experiment to test how changing the inside of a model changes its density and how fast it sinks.

Research question/problem & predictions

Question: How does density affect whether an object sinks or floats in water?

Predictions: I think the Stitch model with fish weights will sink the fastest because it's more dense. Then the Stitch plaster model will be second. The lighter Stitch styrofoam will sink slower or float.

Investigative methods

Materials:

- Stitch plaster mold
- Plaster of Paris + Water
- Fish weights (3 bags, 3.5 oz each)
- Styrofoam
- Morton Canning & Pickling Salt
- Mixing bowl + whisk
- Scale
- Timer
- Clear container + salt water

Procedure

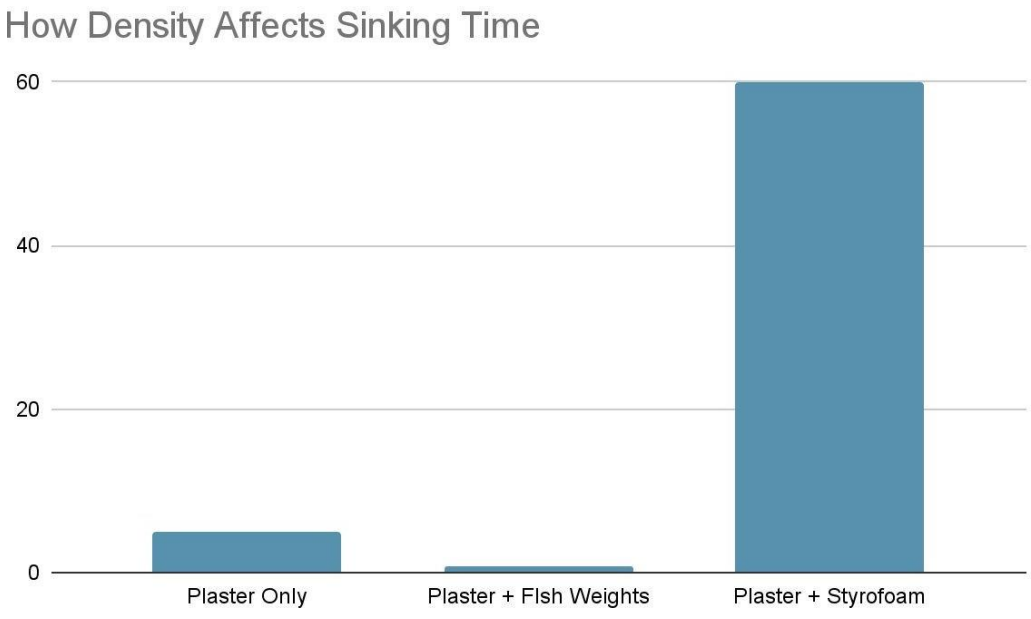
1. Created three identical Stitch models using the same mold.
2. Model 1: Plaster only.
3. Model 2: Plaster + fish weights.
4. Model 3: Plaster + styrofoam.
5. Let models harden completely.
6. Weighed each model.
7. Dropped each model into salt water.
8. Measured sinking time using a timer.
9. Recorded results.

Controlled variables: The size and shape of each model were kept the same so only the material inside changed.

Results

- All three Stitch models were the same size and shape.
- Fish weights model (14.63 oz) sank in 0.8 seconds.
- Plain plaster model (11.4 oz) sank in 5 seconds.
- Styrofoam model (10.4 oz) floated after 60 seconds.
- The more dense the model, the faster it sank.

Stitch Model	Weight	What Happened	
Plaster Only	11.4 oz	Sank in 5 seconds	
Plaster + FIsh Weights	14.63 oz	Sank in 0.8 seconds	
Plaster + Styrofoam	10.40 oz	Didn't sink after 60 seconds	



Discussion and interpretation

- My hypothesis was correct.
- The model with fish weights had the greatest density and sank the fastest.
- When density increased, the model sank faster.
- The styrofoam model floated because it was less dense than salt water and trapped air.
- This experiment shows that density decides whether something sinks or floats.

Implications and ideas for future research

- This experiment shows that density affects how fast something sinks or floats.
- The more dense the model was, the faster it sank.
- If I did this again, I would test the models in fresh water to see if the results change.
- I would also try different amounts of salt to see how that affects sinking time.

References

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