Scientist #: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Aluminum Boats: Day 1

Question: How can we design a boat to hold as much mass as possible?

Make a Model: Given a 400 cm2 (20cm x 20cm) piece of aluminum foil, a container of water, and 8.2 g washers, design a boat to hold as many washers as possible.

Carefully diagram your boat design – side view and top view. Provide estimates for the depth, length, and width of the boat in centimeters. Please use circles to represent where you will place your washers.

|  |  |
| --- | --- |
| Top view (bird’s eye) | Side view (water level) |
| Width: \_\_\_\_\_\_ cm  Length: \_\_\_\_\_\_ cm | Depth: \_\_\_\_\_\_ cm |

Predict: How many washers will your boat be able to hold? \_\_\_\_\_

Test: Place the boat in the water – no sides can be touching. Place one washer in the boat every three seconds. Record the number of washers it supports – do not count the final washer that sinks the boat.

Conclusions: How many washers did your boat hold? \_\_\_\_\_

Day 2:

Question: Which designs from yesterday’s tests supported the most mass? Why?

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Make a model: You will be given the same materials as yesterday. Make a model that will hold more mass. Carefully diagram your boat design – side view and top view. Provide estimates for the depth, length, and width of the boat in centimeters. Please use circles to represent where you will place your washers.

|  |  |
| --- | --- |
| Top view (bird’s eye) | Side view (water level) |
| Width: \_\_\_\_\_\_ cm  Length: \_\_\_\_\_\_ cm | Depth: \_\_\_\_\_\_ cm |

How many washers did your boat hold? \_\_\_\_\_

How many more was that than yesterday? \_\_\_\_\_

What was the approximate volume of today’s boat? \_\_\_\_\_ cm3

What was the approximate volume of yesterday’s boat? \_\_\_\_\_ cm3

Conclusion: What have you learned about volume, mass, density, and buoyancy?

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