

16.4: Procedures

You will determine the height of the water line required for a raft to float.

Do not place wood blocks into the water until specifically instructed.

1. Draw a table in which to record physical quantities for your wood rafts. **Do not fill in data until you have read the instructions for obtaining that data.**

Table 16.4.1: Physical Quantities

	Mass (kg)	Weight (N)	Length (m)	Width (m)	Bottom Area (m^2)
Raft 1					
Raft 2					

Choose one of the wood blocks to be your 1st wood raft. Use this raft for the following procedures.

2. Measure and record the mass of your 1st raft, in kilograms. Calculate and record the weight of your 1st wood raft in Newtons. Repeat this process for your 2nd raft.
3. Measure and record the length and width of your 1st raft, in meters. Use these measurements to calculate the bottom area of your 1st raft, and record this value. Repeat this process for your 2nd raft.

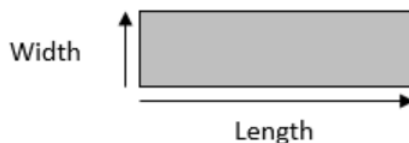


Figure 16.4.1

4. Draw a 2nd table in which to record water line information. Read the instructions for obtaining the data.

Table 16.4.2: Water Line Height

	Predicted	Measured	Error
Raft 1			
Raft 2			

5. Hold the 1st wood raft in your hand and hypothesize (guess) the level to which the raft will need to sink into the water in order to float. Predict where the water line will be, calculate or measure the predicted height from the bottom of the block to the level the water will rise, and record this height in centimeters, as the predicted water line height. You may choose whether to simply predict this water line height or use the two equations for pressure to calculate it. **The density of water is 1,000 kg/m³.**

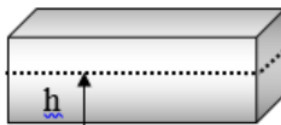


Figure 16.4.2

6. Fill the plastic tub about half full of water. Gently place your 1st raft into the tub of water, carefully remove it, and measure the amount of the raft thickness that is wet, in centimeters. Record this value as your measured water line height.



Figure 16.4.3: Copy and Paste Caption here. (Copyright; author via source)

7. Calculate and record the amount of error for this investigation, using your measured value as the standard value.
8. Hold both wood rafts in your hands. Discuss and hypothesize the level to which the 2nd wood raft will need to sink into the water in order to float. Predict where the water line will be, calculate or measure the predicted height from the bottom of the block to the level the water will rise, and record this height in centimeters, as the predicted water line height. You may choose whether to simply predict this water line height or use the two equations for pressure to calculate it. **The density of water is 1,000 kg/m³.**
9. Gently place your 2nd raft into the tub of water, carefully remove it, and measure the amount of the raft thickness that is wet, in centimeters. Record this value as your measured water line height for your 2nd wood raft. Calculate and record the amount of error, using your measured value as the standard value.

Clean-up

- Discard water outside (water plants)
- Thoroughly dry everything used in the experiment

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