

Sail Away  
Pre/Post Assessment Rev 1

1. Your friend has heard about Archimedes' Principle but doesn't know what it is. Help your friend by using the space provided to describe the Archimedes Principle?

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2. Water has a density of 1.00 grams/cubic centimeter (gr/cc). **Circle** the materials that will float in water and **underline** the materials that will sink in water.

<u>Substance</u>	<u>grams/cc</u>	<u>Substance</u>	<u>grams/cc</u>
Ice	.92	Lead	11.34
Aluminum	2.7	Gold	19.30
Balsa Wood	.16	Sea Water	1.03
Pine	.50		

3. Your team is making a sail boat and you have been studying Newton's Three Laws of Motion and how they relate to sailing a boat. Below are three sentences about sailing. Match each sentence with one of Newton's Laws that best fits the event.

**A) Newton's 1<sup>st</sup> Law of Motion    B) Newton's 2<sup>nd</sup> Law    C) Newton's 3<sup>rd</sup> Law**

\_\_\_\_\_ The thrust force of the wind overcomes the drag force of the water, and the sailboat moves forward.

\_\_\_\_\_ The sail pulls forward on the boat mast, the mast pulls backwards on the sail and the mast and the boat hull move forwards across the water.

\_\_\_\_\_ How fast a sailboat accelerates is directly proportional to the strength of the wind, minus the drag force.

4. Your team needs to figure out how to keep the boat from tipping over. Which of the following parts of a sail boat would provide the most effective "righting force" to counteract tipping forces? **Circle the correct parts.**

Sail                      Mast                      Keel                      Rudder  
Ballast                      Hull                      Anchor

5. Complete the following sentence with the correct word from the list above.

**The \_\_\_\_\_ is used to steer the boat.**

6. Fill in the blank in the following sentence.

**A "moment" or a "moment arm" is a term that refers to a \_\_\_\_\_ applied over a distance.**