

Sailboat Lab Sheet Dictionary

Assumption: something that is taken for granted as being true. A belief or logical construct underlying a plan or decision.

Boom: a pole securing the bottom of a sail, aiding the position of a sail. The boom attaches to the mast at a joint called the gooseneck. The gooseneck pivots allowing the boom to be easily adjusted by the main sheet.

Hypothesis: (assumption in ancient Greek) a proposed explanation for a phenomenon. A prediction that can be tested and is based on an observation or experience.

Keel: refers to a rigid, flat piece of material anchored to the lowest part of the hull and used to give the ship greater control and stability. Keels are common in sailboats, where they provide lateral resistance in the water to convert lateral force from the sails into forward motion of the boat.

Knot: a unit of speed most often used by marine interests, in which one nautical mile per hour, is achieved. One knot equals approximately 1.15 miles per hour, or 6076 feet per hour.

Latitude: the angular distance north or south from the Earth's equator measured in degrees on the meridian of a point; Equator being 0° and the poles 90° N and 90° S.

Longitude: the angular distance east or west, between the meridian of a particular place on Earth and that of the Prime Meridian (located in Greenwich, England) expressed in degrees or time.

Mainsail: the principal sail of a sailing vessel. In square-rigged ships it is the lowest sail on the main mast. The main power source for a sailboat

Rudder: a device mounted near the stern of a vessel to control direction. An upright blade that can be turned left or right, about a vertical axis, generally mounted off the stern (the back end of a boat), and extending below the waterline.

Theory: a theory is generally accepted as valid due to having survived repeated testing. A scientific theory is an established and experimentally verified fact or collection of facts about the world.

Christopher Columbus (1451 – 1506) born in Genoa, Italy

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SAILBOAT Lab Sheet



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Why and how to keep a Lab Sheet

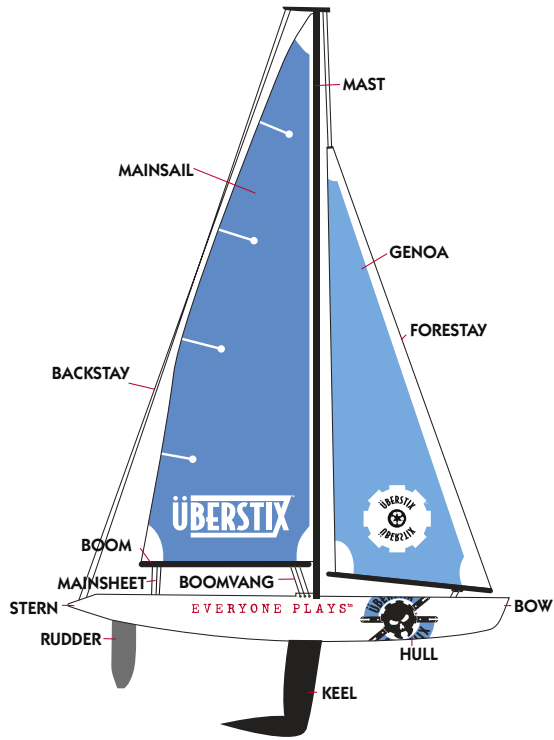
- To prove or disprove your hypothesis, theory, or assumption, keep track of your experiments. Be sure to update your Lab Sheet after each experiment.
- Be sure to put your name and contact information on the front of your Lab Sheet.
- Always use a pen for all entries in your lab sheet including dates and page numbers.
- List all observations made during your experiment. Write down data directly in your lab notebook. You can also tape, staple or glue copies of data in your Lab Sheet book.
- If an experiment fails, be sure to note that it failed, and why. This is an important part of the learning process. By understanding why something doesn't work, it helps point us in the direction of what will work.
- Before each experiment, make notes of what you think the outcome will be. Warning: this can sometimes be a humbling experience.

The purpose of your experiments is to: Improve the performance of the Sailboat.

Start by testing the Sailboat in its current embodiment (with no keel or rudder). A swimming pool, pond or lake works best. Be sure to attach a string to the Sailboat so you can retrieve it. You will find that there is much room for improvement in the design.

Verifying Results: It is necessary to run experiments more than once to verify that results are consistent and not just an accident. Once you confirm that you are getting the same basic results each time you repeat the experiment, make a note in your lab book and continue on to the next test.

1. Add a keel and test what effect it has on performance.
2. Increase the size of the keel and see what happens.
3. Adjust the line to the boom so that the mainsail has more play.
4. Test the effect of adding ballast to the float bottles. You can try a roll of pennies in each bottle or add equal amounts of water.
5. If the wind is too strong, try adding an outrigger float to one or both sides of the sailboat. Repeat test number 3 with the new bottles.
6. Try designing an adjustable rudder and attach it to the stern.
7. Now combine the most successful results from your experiments above to achieve the ultimate sailboat.



Date Test Performed _____

What I assumed would happen: _____

What actually happened: _____

Date Test Performed _____

What I assumed would happen: _____

What actually happened: _____

Date Test Performed _____

What I assumed would happen: _____

What actually happened: _____

Date Test Performed _____

What I assumed would happen: _____

What actually happened: _____

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