



## STEM Teaser Family Activities | **Mechanical Engineering**

# Staying Afloat

Grade Levels  
**2-5**

### Did You Know?

Girls are less likely than boys to pursue careers related to STEM (science, technology, engineering, and math), so it's important to encourage all of our children to explore these areas at a young age. Engineering is fun, and it's all about designing and building solutions to real-world problems. When children tackle engineering projects, they strengthen their problem solving, creativity, collaboration, and cooperation skills...which are important lifelong skills no matter the career path they eventually choose!

### Help Them Lead at Home

**Talk:** Begin a discussion with your child about the last time they were in a pool, ocean, lake, or even the bathtub. Were they able to float? What did it feel like? Was it hard or easy to stay on the top of the water? Tell your child that when an object is buoyant, it is able to float on water. Together, discuss objects that you predict would float and sink.

**Do:** Explain that your family is going to tackle an engineering project! Together, you are going to try to build a toy boat that will not only float, but will hold as much extra weight as possible. Your family will build this boat entirely out of household materials that you already own. This can be as simple as using straws and tape.

Help your child collect household items that could be used as you build your boat. Then use your sink, bathtub, or a bucket to test out the buoyancy of each item and set aside the items your family would like to use in your boat construction.

Next, work together to build your boat! It may be helpful for your child to first draw a picture of the boat on a separate piece of paper before you begin. Then, as you work together to construct your boat, test it out in water every so often so you make sure it can float.

After your boat is complete, it's time to get ready to add weight. Gather materials you can use to add weight to your boat. Blocks, Legos, or coins are just a few ideas, but anything small that can get wet will do the trick! Then, place your boat back in the water and have your child add weight, one item at a time. Encourage your child to think about where it makes sense to place this weight and try distributing the weight in different areas to see what works best.

#### **Boat material ideas include:**

plastic bottles, milk cartons, cardboard boxes, aluminum foil, plastic wrap, balls, plastic utensils, food storage containers, and more!

Check out no-cost resources for you and your girl to extend the learning at home: <http://bit.ly/GirlScoutsDE>



Whenever your boat starts to sink, lift it entirely out of the water. Count the number of weights that you were able to put on it before it started to submerge. Then discuss with your child:

- Is there anything we may be able to change about our boat to help it carry more weight?
- Could the weight be added in a different way so it affects the boat less?

Work with your child to make changes to your boat that may help it carry more weight. It's okay to start again from scratch if you need to. Then, when you're ready, it's time for Take Two! Work together to see if you can successfully add more weight than you did the first time. When your boat begins to sink this time, try moving the weight around. If this works and stops the boat from sinking, keep adding more weight until it goes under!

### For More Tips

To learn more about buoyancy and exactly why some items float while others sink, check out this Kids *Want to Know* [video](#).

### For More Engineering Fun

- Buoyancy Competition: Separate your family into two teams and compete to see whose boat can hold the most weight and still stay afloat!
- Race Against Time: Create two new boats and have a similar competition... But this time, use a stop watch to see which boat can hold the most weight and stay above water for the longest amount of time.
- Shape Experiments: Does shape matter? Create a second boat that has an entirely different shape and try the weight test once more. Does this new shape seem to make a difference?

**Attention Parents and Caregivers:** Is your girl interested in science, technology, and how things are designed and made? Then Girl Scouts is the place for her! Girl Scouts' popular Mechanical Engineering program gives her the opportunity to use design thinking to complete hands-on mechanical engineering design challenges. This activity is powered by Girl Scouts of the USA. Girl Scouts is the place for every girl, and it always will be. [SIGN UP NOW.](#)

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