

Float Your Boat Cub Camporee

STEM Activity



The objectives here are to:

1. Introduce Cubs to STEM through an “experiment” of trying to build the best boat for holding the most weight. We use pennies as a consistent way to add weight to be “scientific.
2. Introduce leaders & parents to the STEM program by
 - a. watching their cubs do the experiment
 - b. receiving various handouts
 - c. talking with the STEM representative
3. The overall goal is to promote STEM and, specifically, the Nova program.

You will need to adapt and modify to the resources you have and the # of STEM volunteers you can muster.

Nova Award requirements achievable here:

Science Everywhere

#3: Act like a scientist! Do EACH of the following:

#5: Discuss with your counselor how science affects your everyday life.

- If and only if they keep records, etc. maybe back at camp or at a pack meeting later.

Flotation experiment:

- Lakes: 8 or so disposable turkey roasting pans or equivalent.
- 1 water bucket if a water supply is nearby or 10 gal of water.
- 1000 pennies or so in 4 containers that can sit near the Lakes. Scouts can float up to 400 pennies in one boat and there will be several going at the same time.
- 3 boxes of 200 cut sheets of Aluminum foil. We had 733 registered people (over half non-Cubs) and went into a 3rd box. Some of the Cubs went a bit nuts grabbing sheets of foil indiscriminately.
- A clear plastic cup and a smaller cup, Ping-Pong ball, golf ball, etc. that you can use to show the displacement of water clearly because the object almost fills the water container. Maybe, place this at the adult table and use it as a teaching moment. They can teach the Cubs later...
- A rope, tape, and/or sign telling parents and leaders to stay over here, while the Cubs do the experiment on their own.
- A 50-word handout on displacement so that leaders/parents can become instant experts and explain it to the youth. Here is something I drafted, simplified Wikipedia. Edits welcome!

We are measuring buoyancy and flotation here. The boat floats because it pushes an equal weight of water out of the way. The more weight (pennies) the more water is pushed up. The idea here and with real boats is to distribute the weight over a large surface area, maintain balance, and maintain structure so your boat does not fold up. The surface

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area is important because we want as much light air as possible.

Archimedes' principle: Any floating object displaces its own weight of fluid.

- A list of discussion questions with Cubs to discuss back at camp that evening to fulfill the “Discuss with your counselor how science affects your everyday life” requirement:
1. What did you learn today?
 - Heavier than water things can float.
 - Shape matters
 - Structure matters—if a side caved in, the water rushed in and it sank.
 2. What shape boat worked best?
 3. Why?
 4. Could you have filled your boat with rocks and had the same experiment?
 - No. The principle is the same, but pennies all weigh the same, so we could scientifically compare our experiments.

Support Equipment:

- ✓ Use one of the turkey pans as a trash receptacle and watch for mixed pennies and foil—some will escape, of course...
- ✓ Plastic trash bags
- ✓ Ground cloth to avoid mud and make it easy to find pennies.
- ✓ Chairs for the staff
- ✓ 2 Tables
 - One for paper for leaders
 - One for foil and a place to fold their boats.
 - We had everything on one table and paper got wet!
- ✓ Water, coffee, sunscreen, etc. for the STEM staff
- ✓ Paper Towels to dry off, especially if it is cold, rainy, etc.
- ✓ Shelter for staff in case of rain

Note: STEM is an important way to communicate the significance and relevance of many Scouting activities. Feel free to use this explanation as a template to develop other STEM explanations you may want to use for various unit events throughout your Scouting year.

Resources

If you write an InstaSTEM, please submit to Mitch Erickson (mderickson77@comcast.net); we'll edit and add it to the council's collection and you will do a good turn by helping other units integrate STEM into their programs. The Patriots Path Council's [STEM website](#) contains key information to Council and National resources.

<http://programs.ppbsa.org/stem/>



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