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Mechanical Engineering: Float a Boat

Activity

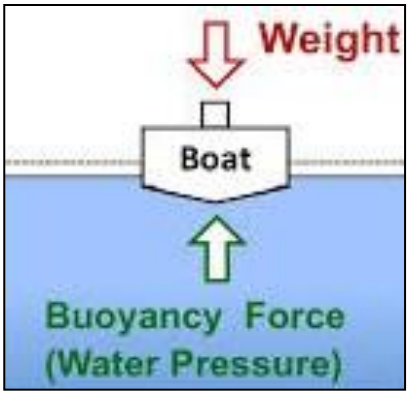
Design and build a floating object out of the materials given to you. You will be given one minute to brainstorm ideas and come up with your design.

1. When brainstorming time is up, you will have four minutes to construct your creation.
2. Once the team has finished with construction, someone from the team will load the weights one by one into the boat.
3. Things to consider when constructing: where will the weights be placed, leakage, strength of material

Materials

Aluminum foil
Popsicle sticks
Rubber bands
Tape
Construction paper

As many weights as needed



Societal Impacts and Real-World Examples

This activity shows the importance of planning out a project before beginning the build process. It also teaches students to think about what materials make the most sense for their specific task and goals. Students will also notice that having a short build time makes it much more difficult to complete more complex designs.

A real-world example is when designing a boat, engineers have to calculate the amount of water that needs to be displaced to keep the boat afloat-it must displace its weight in water. Additionally, when designing something new, such as building or a car, the properties of the materials that are being used must be considered to make sure that the product will work properly, is structurally sound, etc.

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Mechanical Engineering: Tricky Towers

Materials:

- 10 pieces of angel hair pasta (or skewers, sticks)
- 5 mini marshmallows
- A strip of masking (any) tape
- 5 normal/jumbo marshmallows
  (styrofoam, packing peanuts, or poster putty work too)

Activity:

Using the given materials, your job is to build the tallest freestanding tower!

1. Students will get into teams of 2-4, if not individually.
2. Everyone will be given 30 seconds to think of ideas and how to approach this challenge.
3. After brainstorming, you will have 3.5 minutes to construct your design.

Rules:

- Must take hands off the tower when the activity ends
- Tower must be free standing at time of measurement
- You can't get more tape than what was given to you

How did working in a team help you build your tower?

What improvements would you make in your structure?

Real World examples and Social Impacts:

This activity aims to provide an understanding of material science and structure integrity. Participants will be able to use the materials given in any way they want, but they must use them effectively to build a well-supported structure.

As engineers, we are tasked with creating things out of materials that may have different properties and uses. Some materials may be stronger than others in one way but not others.

In the real world, knowing the strength of different materials is useful in designing strong, well supported buildings.