

Sam's Submarine Challenge

Tonight we are stepping into the shoes of engineers! We will be using the 6 STEM skills: Problem Solving, Creativity, Inquiry, Critical Thinking, the Engineering Design Process, and Collaboration to designing and building a submarine to safely transport Sam, the gummy worm. Sam traveled all the way to Norfolk, Virginia to see the Atlantic Ocean for the first time! To explore the ocean, he will need a submarine to keep him dry! He has to go all the way underwater to the ocean floor in his makeshift submarine from materials he found littered on the beach. Our challenge tonight is to design and build a submarine to safely transport Sam on his ocean adventure AND keep him dry! He still can't swim!

Step 1: Define the Problem

- What is the problem in this challenge? What do we need to figure out?
- Talk with your family team about how submarines are designed to keep passengers safe from leaks and pressure.

Step 2: Plan Solutions

- Discuss as a family how pressure can affect submarines as they are submerged in deep water and what materials you can use to safely help Sam explore the ocean while staying dry.
- Look at your materials and sketch your ideas on a piece of paper. What design of your transportation device will keep Sam dry?

Step 3: Make a Model

- Using the solutions we have planned, try to make a model and start to experiment with combining materials to create your submarine design.

Step 4: Test the Model

- Now it's time to test your submarine prototype. You will take your prototype to the tubs of water to have it tested.
- Did it work? If it fails to float, sink, or keep Sam dry, then redesign.

Step 5: Reflect and Redesign

- If your submarine is not working for all steps, create new solutions, use different materials and change the design of the submarine.
- What are different ideas you used as a family? Did you learn from mistakes? What happened when you tried again?