

Summer at the Library 2022

MAKE WAVES



Grades 3-5

Cargo-A-Go-Go

Find how much your ship can carry or grab a friend and see whose ship can deliver the most cargo to its final destination!

What will you learn?

- How to create a boat out of tin foil that can carry cargo.
- How different parts of the boat can hold more freight (cargo) due to design
- How can you improve buoyancy + load bearing by designing/redesigning your boat

Materials:

- Square piece of aluminum foil (or two pieces, if playing with a friend)
- Bowl of water
- Pennies (Extra Challenging: any coins or tiny figures you can find!)
- A towel
- Piece of paper
- Pencil

Instructions:

- What should your boat look like? Think about the designs you have in mind and draw it out on a piece of paper.
- Using the tin foil, craft your ship based on the design.
- Fill up your bowl with water being careful not to overfill it.
- If doing this solo, gently place your ship in the bowl of water. Slowly and strategically place the coins on your boat. If doing this with a friend, have them slowly place the items in your boat.
- Keep a tally of how many items (and what) your boat was able to carry before it sinks. If you are challenging a friend, repeat steps 1-3 with them being sure to use



#NYPLsummer
NYPL.org/summer

the towel to dry anything that may have touched water because water itself carries weight!

- Be sure to try the tin foil too! This game can be repeated as many times as the ship's material (aluminum foil) will hold.

Reflection Questions:

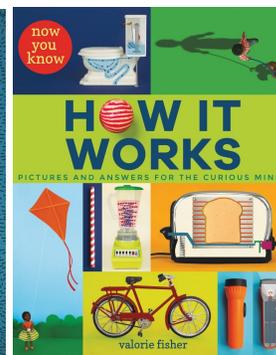
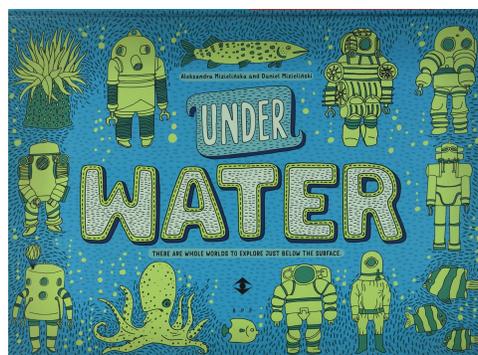
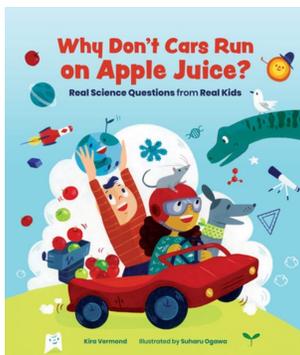
- How did your ship look compared to the original sketch? Did you find any challenge when translating a 2D object (your picture) into a 3D object (your tin foil ship)?
- Did you find points of your ship that could carry heavier or more weight than others? Did you find points that may have helped sink your ship?
- If you redesigned your ship or were playing against a friend, did you find that one ship design carried more weight/was more buoyant than the other?

Explanation:

In this experiment, there are two forces in play. The first? Gravity! Gravity wants to sink your ship, fortunately the force of buoyancy provided by the water helps your boat stay afloat. Gravity is pushing down the weight of both the aluminum foil boat and the items you place in the boat, displacing the buoyant force of the water. When the water can no longer fend off the gravity (too heavy!), the boat and all of its cargo will sink.

More to Explore at the Library:

You can check out tons of books about the many water forces at work: here's a small selection to encourage further exploration. We can't wait to hear what you uncover!



Guide created by Anthony Murisco.



#NYPLsummer
NYPL.org/summer