JEdSTEM at-Home Lesson 3 - Buoyancy

Overview:
The JEdSTEM Initiative is dedicated to developing engaged, curious, and innovative Jewish minds for the modern world. This lesson is designed to be done at home as combined parent-child learning and features a simple STEM experiment, Torah story and thought-provoking discussion questions.

Experiment Introduction	**Supplies Needed**
In today's lesson, we are learning about the story of Noah's Ark. Then, we are going to experiment with buoyancy and see what we can create.	
Story Summary - Buoyancy	
Noah was a man who listened to G-d and always tried to do the right thing. Unfortunately, at the time when Noah was living, most of the other people on Earth were mean and violent. Since the world was such a bad place, G-d decided to flood the earth to get rid of all the bad people. G-d instructed Noah to build an Ark big enough for Noah, his kids and their families plus two of every Animal on Earth. The dimensions of the Ark were 300 cubits in length, 50 cubits in width and 30 cubits in height. The art was so big that it took Noah 120 years to finish building it. Once the Ark was done, Noah loaded it up with his family and all of the animals and it started to rain. The rain fell for 40 days and 40 nights until even the tallest mountains were covered with water. After the rain stopped the waters started to recede a little and the Ark came to rest on the peak of the mountains of Ararat. To investigate how quickly the water was receding Noah sent a raven out from the Ark to see if it was safe to leave. The raven flew around and around the Ark, never venturing too far from the Ark. Noah then sent out another bird, this time a dove, who flew around and couldn't find anything. Not to be deterred, Noah sent out another dove, this one did find	

something, an olive branch. Proving that things had started to grow back after the flood. Finally, Noah sent out one more dove, which didn't return. This dove found a new home, and the Earth was finally ready to have people and animals live on it. Once all the animals were off the Ark G-d talked to Noah again and showed Noah a rainbow as a symbol that G-d would never again flood the Earth. Genesis 6-11 For a more detailed version of this story follow this Link	
Questions	
• How long do you think a cubit is? • In what ways do you try to be like Noah? • Do you think the Ark could really have floated with all the animals on it?	
Experiment Procedure	
In this lesson we learned about Noah and the great flood that covered the entire Earth. We are going to try and create our own boats that can float just like Noah's Ark 1. Fill the large bowl with water. 2. Using the building materials (Aluminum Foil, Cardboard, Tape plus optionals) build a boat. 3. Test the buoyancy of the boat by placing it on the water. a. If the boat floats, see how much weight it can support by placing the coins on it. b. If the boat sinks, take it out and adjust the materials to try and get it to float.	• Large Bowl • Water • Aluminum Foil • Cardboard • Tape • Coins, marbles, or mini stones Optional: • Bottle Corks • Toothpicks • Small paper plate • Mini flower pot

Experiment Explanation	
<u>How do you think this works?</u> The boat you made is able to float due to buoyancy. Buoyancy is the ability of an object to float. When the boats from the experiment are placed in the water they displace water in the bowl. *You can test this in the bowl of water we are using for the experiment by putting your hand into the water and watching as the water rises on the sides of the bowl.* If the weight of the boat is less than the weight of the water that has been displaced it will float, if it is greater it will sink. Buoyancy is what allows boats to float while heavier objects like rocks to sink when they are placed in the water. The number of coins you can place on your boat before it sinks is the difference between the current weight of the boat and the maximum weight it can be and still float.	
Expand the Experiment	
So you did the experiment and want to know more than you can do? Options: • Try and make the smallest floating boat you can. • Use unique materials to build a floating boat.	
Wrap Up Questions	
What do you think about the experiment? How much weight in coins could you boat support? What materials had the most buoyancy? Which had the least?	