

Camp Fire  
MINNESOTA

# My nature connection

WATER  
EXPLORATION  
EXPERIMENTS

GRADES: 3+

## LET'S THINK ABOUT WATER

Have you ever seen drops of water forming on blades of grass after it rains? Or watched a boat gliding on the water and wondered how it stays afloat? Water is all around us- it makes up over 70% of the earth's surface- so let's discover a little more about why it acts the way it does.

## ACTIVITY (60 MINUTES)

### INTRODUCTION

Today we are going to explore a few different properties of water. Water is made up of tiny little particles called molecules. Each molecule has two hydrogen atoms and one oxygen atom, which is why you sometimes see it water written as  $H_2O$ . The molecules in water act in very unique ways that you may have noticed before, like forming droplets and allowing things to float. Today we will discover why that happens.

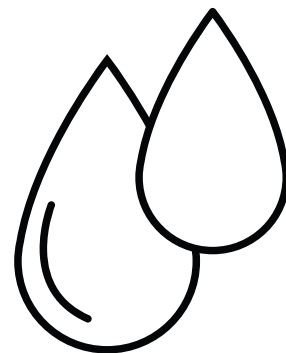
### EXPERIMENT 1: PENNY DROPS

First, we are going to start out with a little experiment. How many drops of water do you think you can fit on top of a penny? Take a second to think about it and write down your guess on your worksheet or a sheet of paper.

Now, using an eyedropper or carefully using your finger, started adding drops of water one by one onto the penny. Make sure you go slow with this!

#### WHAT YOU'LL NEED:

- Penny
- Eye dropper (optional)
- Bowl of water
- Paper (construction or printer paper)
- Tinfoil
- Bag of coins or small rocks
- Water Exploration Handouts (optional)



#### SETTING

Indoor  
and  
Outdoor

Try getting down to eye level and see what the water looks like on the penny. See how it is making a small dome? That's because the molecules in the water are holding on tightly to each other. They form a tiny layer on the outside of the water, almost like a skin. This is called surface tension. Draw what you see on the worksheet.

Surface tension isn't just for holding drops of water on a penny, it's important in other ways too. It's what keeps all the cells in our body from falling apart. And, it allows some bugs that are heavier than water to actually move across it- like these cool bugs called water striders.



WATER STRIDERS

## CONNECTING WITH QUESTIONS

- How many drops fit on your penny?
- Was your hypothesis close or far off?
- If you want to explore further- try adding different substances to your water like oil, dish soap, or salt. Does this change how many drops of water fit on your penny? How do you think those substances affect the surface tension?



## EXPERIMENT 2: FLOAT YOUR BOAT

If humans want to be on the water, we don't get to cruise across on our legs like water striders. We need a boat.

Now we are going to try to build our own boat and see how much weight it can hold. For this next part you'll need some paper, some tinfoil, a large bowl or tub of water, and some creativity. If you have a family member or someone living with you that you'd like to challenge- ask them to join you! You can each create your own boat and see which one can hold the most weight before sinking!

**BUOYANCY:**  
The force on an object that makes it move upward.

Boats can float on water using something called buoyancy- that's the force on an object that makes it move upwards. Boats are buoyant because their curved shapes displace the water around them, causing that upward force. Rocks and other objects don't have that curved, hollow shape, which is why they sink right away. How can you use this idea to design a boat?

First, draw out your design . Then, begin to fold the paper and tinfoil into a shape that you think will be able to float and hold a large amount of coins or pebbles. Get creative with it! Does it look like a canoe, a cruise ship, or something completely different?

Once you have your boat, It's time to test them out. Take a second to think about how many coins or pebbles your boat will be able to hold and write down your guess. Now, slowly start adding them until you see your boat begin to sink.

Once your boat begins to sink, take out the coins or rocks and count how many it could actually hold. Write down the actual number. Once your boat sinks you can move on to the questions below or try to design a new, stronger boat.

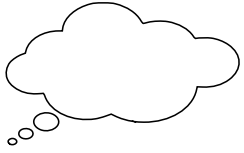
Feel free to do this activity as many times as you'd like. You can even bring your boat outdoors to test it in puddles or streams- just make sure you are kind to the earth and don't leave it outdoors.

## CONNECTING WITH QUESTIONS

- Did your boat hold as many coins as you thought?
- What do you think you could change to make your boat stronger or more buoyant?
- What other materials do you think would be good for making a boat? You can try this experiment with cardboard, milk jugs, and other materials you can think of
- Why are surface tension and buoyancy important for humans, plants, and animals?

HOW COULD  
YOU REDESIGN  
YOUR BOAT TO  
HOLD MORE  
WEIGHT?

## PENNY DROP OBSERVATIONS



How many drops you think the penny will hold:

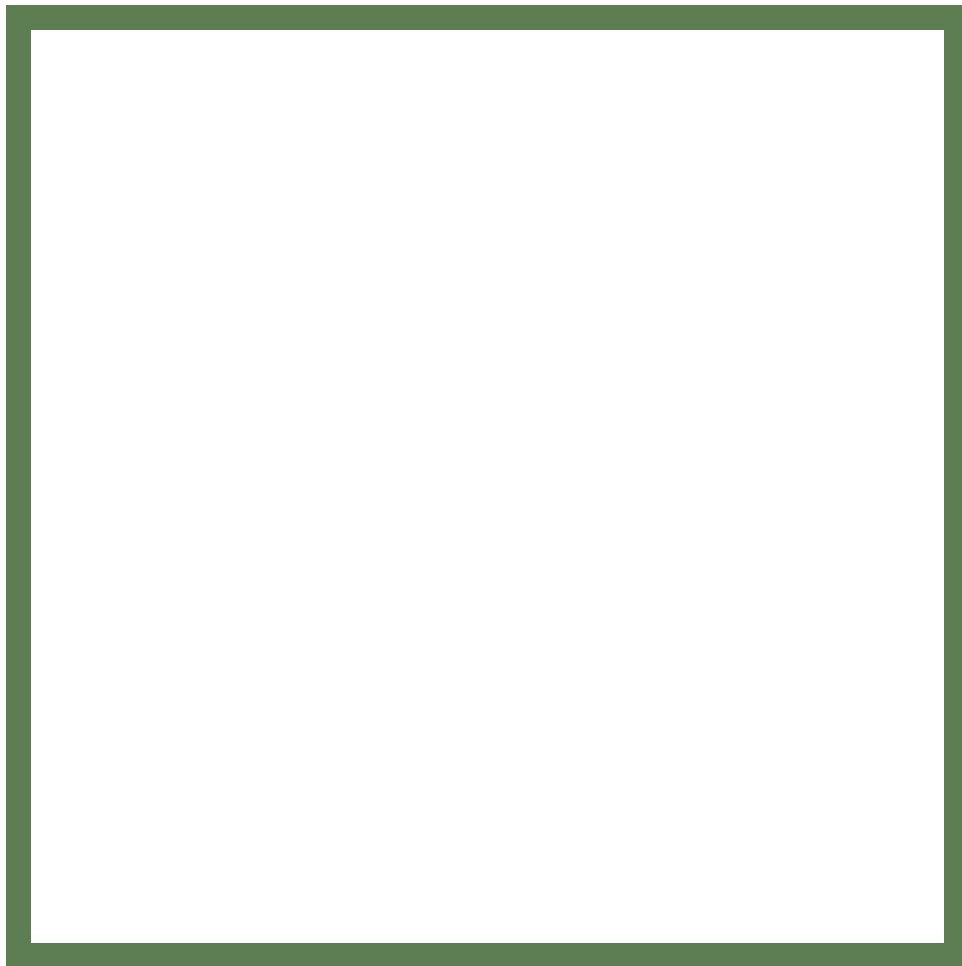
---



How many drops the penny actually holds:

---

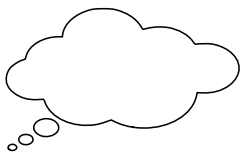
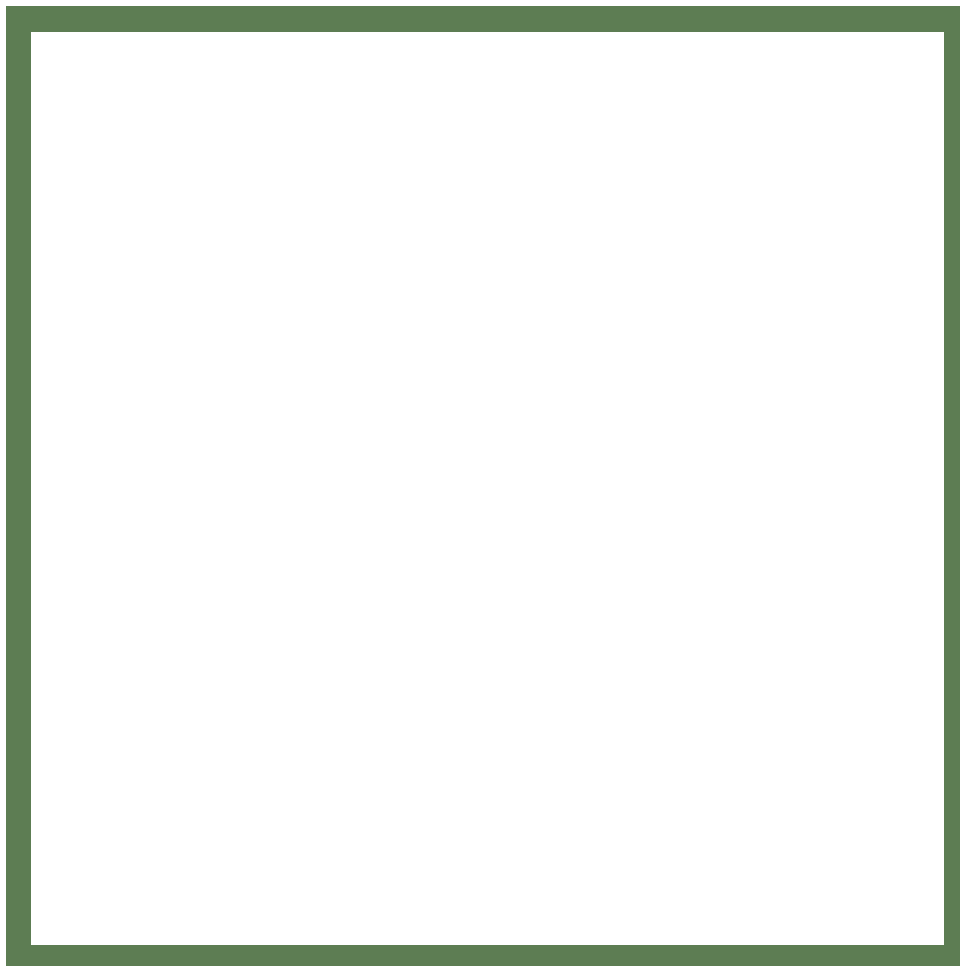
DRAW YOUR OBSERVATIONS- WHAT DO THE DROPS OF WATER LOOK LIKE ON THE PENNY AT EYE LEVEL?



Tip: Try this experiment again using different substances mixed with the water like oil, dish soap, and salt

# BOAT DESIGN AND OBSERVATIONS

DRAW THE DESIGN OF A BOAT THAT YOU CAN CREATE WITH TINFOIL AND PAPER



How many coins/ pebbles you think the boat will hold:

---



How many the boat actually holds:

---



Tip: Re-print this page to try this experiment again by re-designing your boat or creating it using different materials.