Activities: Water, Ice, and Steam

Introduction

Introduce kids to the three states that water can be in: liquid, solid (ice), and gas (steam or vapor).

Supplies

- Electric skillet with lid
- Ice cubes
- Water

- Clear cup or glass
- Shaving cream
- Blue food coloring

Get kids thinking ...

Start by asking a couple of questions:

- What does ice or snow feel like?
- What does water feel like?
- What does steam or vapor feels like?
- What makes water change its state, from liquid to solid to gas?
- What happens to ice when you take it out of the freezer?

Let's get started!

Put the ice in electric skillet. If you have time, let the ice melt on its own. If not, turn on the skillet to low and let the ice melt.

Once the ice has melted, ask the kids what they have observed. How has the ice changed? What state is the ice in now? (liquid) What shape is it? Ask the kids to predict what would happen if you put the water in the freezer. What would happen if you turned up the heat?

Turn up the heat on the skillet and bring the water to a simmer, so that the kids can see the water turning into steam. Be careful to kids away from the hot skillet and steam.



Water Basics



Ask the kids what they have observed about the water. How has it changed? What state is it in now? What shape is it?

Ask the kids to predict what would happen if you turned off the heat. Ask the kids to predict what would happen if the steam met with very cold air.

If you have a lid, put it on the skillet and let the steam collect and condense on the inside. After a few minutes, lift up the lid and show the kids what the steam is doing.

Ask them what they think is happening. What do they observe? How has the steam changed? What state is the steam in now? (liquid) What shape is it? What are the drops of water doing?

Introduce water words

Talk about these words and what they mean: **evaporation**, **condensation**, **precipitation**, and for extra fun: **sublimation** (ice to gas state, skipping the water stage) and **transpiration** (water vapor produced by photosynthesis).

A spoonful of cloud

Have kids breathe on the back of a big metal spoon. What happens? They should see a tiny cloud of water vapor on the spoon! Explain that this is how real clouds form — when warm, moist air and cool air come together.

Shaving cream clouds

- Fill a clear plastic cup with water and top with shaving cream (this is your cloud)
- Add a few drops of blue food coloring to the top of the shaving cream
- Watch as the blue dye (this is the rain) sinks through the cloud to fall as rain in the water

Ask the kids what happened — why did the food coloring drops (the rain) fall through the shaving cream (cloud)? Explain that when water vapor cools, it collects in clouds, and eventually gets heavy enough that it falls. Water collects because it's molecules like to be close together (surface tension), and that's why it makes drops, pools and larger bodies of water.



Make a human thunderstorm

Say: "As a group, right in this room, we are going to create a rainstorm. We will make the rainstorm using our hands and feet. Watch my hands, then follow and do the same thing." This group exercise can be a great warm up before each day of River Rangers activities!

- Rub hands together (wind)
- Snap fingers (sprinkling rain)
- Clap hands (heavier rain)
- Slap thighs (pouring rain)
- Stomp feet and continue slapping thighs (thunder and heavy rain)
- Slap thighs (thunder stopped)
- Clap hands (rain is slowing)
- Snap fingers (rain is down to a sprinkle)
- Rub hands (sun is coming out and a fresh breeze is blowing)
- Hands on lap (silence after a storm)

Watch the human thunderstorm in action https://www.youtube.com/watch?v=VOU5gAFV9v8



Water Basics



More water cycle activities

Water Cycle in a Bowl (PBS) http://www.pbs.org/parents/adventures-in-learning/2015/07/water-cycle-activity/

Water Cycle in a Plastic Bag (1001 Gardens) https://www.1001gardens.org/2015/08/diy-tutorial-fog-water-rain-create-your-own-water-cycle-in-a-plastic-bag/

Paint with Water and Disappearing Handprints (PBS Plum Landing) https://pbskids.org/plumlanding/educators/activities/pdf/evaporation_station_fam.pdf

Evaporation Station Video (PBS Plum Landing) https://www.pbslearningmedia.org/resource/plum14.sci.life.evapstat/evaporation-station/#. WuiDg5ch3cs

Tornado in a Bottle (Wiki How) https://www.wikihow.com/Make-a-Tornado-in-a-Bottle

Make Rain in a Jar (Learn, Play, Imagine) http://www.learnplayimagine.com/2013/03/how-



Find more River Rangers activities on the Start with a Book website: www.startwithabook.org/river-rangers-book-based-science-adventure