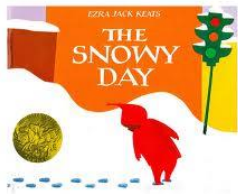


States of Matter Read-Aloud

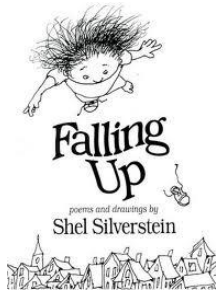
This Read-Aloud introduces the three states of matter and steps of scientific inquiry: prediction (hypothesis), observation (experimentation) and evaluation. Start with books about snow and a demonstration of water in the three states (liquid, solid and gas) and then move on to one of two activities that allow the kids to explore more deeply and practice their scientific inquiry skills.



The Snowy Day by Ezra Jack Keats

Ages 3 and up

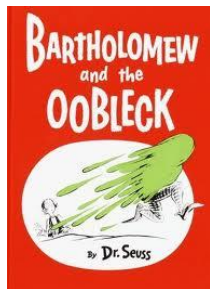
This beloved picture book, with its bold, cut-paper collage illustrations and simple text, chronicles a little boy's adventures in the snow. It also provides an introduction to the states of matter when the snowball he makes and brings into the house melts, turning from a solid to a liquid.



“The Snowball” by Shel Silverstein in ***Falling Up***

Ages 6 to 10

This short poem describes the fate of a snowball brought inside. Again—an introduction to the states of matter when the snowball melts, turning from a solid to a liquid.

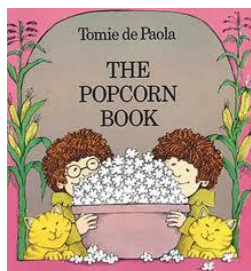


Bartholomew and the Oobleck by Dr. Seuss (use TRC's abridged version)

Ages 6 to 10

What happens when you want something new to fall from the sky? You might just get oobleck. What is it? It's not rain, it's not snow, but it is a mess! This Dr. Seuss favorite is a great introduction to a fun and messy exploration of the states of matter.

OR



The Popcorn Book by Tomie De Paola (use TRC's abridged version)

Ages 6 to 10

Everything you ever wanted to know about popcorn, including how it relates to the states of matter. The reason kernels pop is that the water inside expands to become a gas when heated.

Additional books

The Wind Blew by Pat Hutchins (Ages 4 to 8)

What happens when the wind blows? This rhyming tale explores the havoc created by a gas blowing through town.

The Three Little Pigs (any version) (Ages 4 and up)

The wolf harnesses the power of a gas by huffing and puffing to blow houses down!

What Is the World Made Of? All About Solids, Liquids and Gases by Kathleen Weidner Zoehfeld (Ages 4 to 8)

Simple text and illustrations provide descriptions of the states of matter in everyday situations that kids will recognize.

Experiments with Solids, Liquids and Gases by Christine Taylor-Butler (Ages 6 to 10)

This book explains the characteristics of the different states of matter and offers several easy experiments.

Super Science Lab by Harris (Ages 7 to 10)

With more than 100 experiments, including “Slime Time” (the basis for our Oobleck activity), this book is sure to excite young scientists about exploration and discovery.

What is a Scientist? By Barbara Lehn (Ages 4 to 8)

What does it mean to be a scientist? This book helps kids understand the work scientists do and how they do it.

Books about glaciers, oceans, lakes or rivers and clouds will also provide the opportunity to explore, more deeply, water in its three states.

Intro to States of Matter

You will need water, ice and an electric kettle.

Read *The Snowy Day* and “The Snowball” to introduce the idea of states of matter. Ask the kids what happened to the snowballs.

Then relate their answer to the states of matter: The snowballs were solids, but then they became liquids when they melted.

Ask kids if they can guess what the third state of matter is. Show them ice and water. Ask if anyone can tell you what water is called in the third state.

Explain that today they will be scientists exploring the states of matter. They will **predict**, **observe** and **evaluate** what they see.

Ask them to **predict** what will happen to water when you heat it up.

Ask them to **observe** as you boil water in the electric kettle. Ask them what they see (what they **observe**) and point out the steam if need be. (Be careful to keep kettle and steam away from kids.)

Talk about how heat can change states of matter: Heat can turn a solid to a liquid to a gas (as with water) or heat can turn a liquid into a solid (as with pancake batter on the stove).

If you need a movement activity, you could change some of the words to the song *Going on a Bear Hunt* to reflect snow/ice, water, fog, wind, mud, etc.

Popcorn states of matter activity

You will need popcorn, a hot air popcorn popper (TRC has one to borrow), small, medium and large mixing bowls, cups or coffee filters to serve popped popcorn in.

Ask kid if they can name another gas besides steam. Give a hint that it is all around us.

Read *The Wind Blew* by Hutchins (gas) or *The Little Three Pigs* (gas) and talk about air.

Talk about how the wind is so strong in the three little pigs that it knocks down the house. That's a gas.

Ask the kids if they know what makes popcorn pop. Show kids the hot air popper and how much unpopped popcorn you will add. Have them guess what happens (**predict**) when the popcorn kernels get heated up in the popper.

Ask them to **predict** which size bowl it will fill (have a small, medium, and large bowl).

Pop the popcorn and have the kids **observe**: what do they see, smell, hear and feel? Which bowl did the popcorn fill?

Talk about how the popcorn pops: water inside the kernel turns to steam and makes the kernel explode. Revisit or **evaluate** what their predictions were about volume and about what would make the kernels pop.

Eat the popcorn! And read a little bit from *The Popcorn Book* by Tomie de Paola or other books on hand together or in small groups.

If you need a movement activity try this Popcorn in the Popper energizer:

<https://www.youtube.com/watch?v=Koi-EDhYxA>

Oobleck states of matter activity

<http://www.kidzone.ws/science/cornstarch.htm> instructions and activity sheet

NOTE: If you have a large group, make two batches in two different bowls and pour it into rimmed cookie sheets for kids to put their hands in.

Put newspaper or plastic down first, as it's hard to get out of the carpet!

Also make sure there is a bucket of water on hand for kids to rinse their hands in before washing them

DO NOT put corn starch mixture/oobleck down the drain. It will solidify and clog the drain. Wipe it into a trashcan before washing the cookie sheet or any other utensils you use.

Read *Bartholomew and the Oobleck* (abridged version from TRC office)

Ask them, is Oobleck real? What if we could make some?

Do Cornstarch Suspension/Oobleck experiment.

Ask kids to **predict** what the oobleck will feel like. What will happen to it if you let it drip from your fingers? What will happen when you squeeze it in your fist or try to stir it?

Encourage them to **observe** what the oobleck does when they compress it. Have kids wash hands in bucket when they are done playing with the oobleck.

Encourage the kids to talk about or draw pictures on the activity sheet. Oobleck (your cornstarch concoction) is actually a suspension which sometimes acts like a liquid and sometimes acts like a solid.

Read some of the nonfiction books in small groups if there is time.

Cornstarch Suspension/Oobleck Activity

<http://www.kidzone.ws/science/cornstarch.htm>

What you need

- 1 cup cornstarch
- ABOUT 1/2 cup water
- food coloring
- bowl
- spoon
- pie plate or cookie sheet
- newspaper
- bucket of water for rinsing hands
- paper towels
- Optional: Cornstarch Suspension Printable Activity Sheet

Directions

- Empty 1 cup of cornstarch into a large bowl.
- Stir while you add water SLOWLY -- don't add all of it if you don't need to.
 - You need the consistency of thick pancake batter.
 - It's better to add too little water than too much.
 - Take your time!
- Add a few drops of food coloring.
- Stick your hands in the mixture.
 - Record what it feels like.
 - What happens when you try to roll some into a ball and then leave it alone?
- Pour the water into a pie plate. (water is a liquid)
 - Smack it with your hand.
 - Record what happens.
- Pour the cornstarch mixture into a pie plate or cookie sheet.
 - Smack it with your hand.
 - Record what happens.
 - Does it act differently than the water?

What Happened:

When we talk about "states" of matter, we usually talk about the three types: solid (like a rock), liquid (like water) and gas (like the air we breathe).

A mixture of cornstarch and water make what is known as a suspension. When you squeeze the Cornstarch Suspension it really feels like a solid because its molecules line up. But it looks like a liquid and acts like a liquid when no one is pressing on it because the molecules relax. This is another state of matter, called a suspension (It can act like a liquid, or, when pressed like a solid.).