

## COOL CHEMISTRY KINDERGARTEN-SECOND

### TEKS

<i>Kindergarten:</i>	K.5A, K.5B
<i>First Grade:</i>	1.5A, 1.5B
<i>Second Grade:</i>	2.5A, 2.5B, 2.5C

### Vocabulary

diameter, flexible, gas, heat, liquid, mass, matter, melt, rough, sanding, shape, smooth, solid, texture, volume

### Pre-Show Activity

#### Pre-Show Lesson: Changes in Matter

Post this question on the board: "How can we change matter?"

#### *Materials:*

Per class: dry sponge, coffee cup, ice cube, glass of water, hot plate, pan, freezer, rough piece of wood

Per group: popcorn kernels, chocolate chip, birthday candle, ice cube, water, lima bean seed, balloon with air in it, sandpaper, construction paper, nail file

#### *Procedure:*

1. Get the students' attention with a magic trick which grabs the students' attention and focuses them on the objective – changes in matter. Before the students get to class, position a piece of dry sponge in the bottom of a coffee cup so that it is wedged in. Put an ice cube on top. When the students arrive, tell them that you are going to pour some water into your magic cup. Ask them to observe the changes and be ready to explain what happened. Pour some water into the cup. Utter some secret words and turn over the cup over. All that comes out is a chunk of ice. Ask: "How did the matter change?" "What caused the change?"

2. Tell students that today they are going to be looking at ways to change matter. Distribute a variety of materials to each group; popcorn kernels, chocolate chip, birthday candle, ice cube, water, lima bean seed, balloon with air in it.
3. Ask: "How many ways can you think of to change each of these materials?" Give students time to discuss their ideas in small groups.
4. Debrief as a class. Ask students to classify objects as liquids, solids and gasses. Show how temperature can change the state of matter.
  - Ask: "Is it possible to change any of the liquids into gases?" "How would you do this?" Demonstrate this by heating the water so it changes to water vapor.
  - Ask: "Is it possible to change any of the solids into liquids?" "How would you do this?" Demonstrate this by lighting the candle and melting the ice cube and chocolate chip.
  - Ask: "How do you know if an object is melted?"
  - Ask: "Is it possible to change any of the liquids into solids?"
  - Show students the ice cube and remind them how it was made.
  - How could we change the popcorn kernel? (heat)
  - How could we change the lima bean seed? (add water)
  - How could we change the balloon with air (gas)? Measure its diameter. Put it in the freezer and re-measure after an hour to see if the volume has changed.

In all of the above demonstrations be sure to talk about what is happening to the molecules. As matter is heated, the molecules spread out. As matter is cooled, the molecules come closer together.

5. Using a piece of construction paper, tell students that other ways we can change matter is by folding it, cutting it or sanding it. Give each student a piece of construction paper and a piece of sandpaper. Ask them to sand the construction paper. What happens? Why would we want to sand something? Show them a piece of wood that is rough. Explain that we can sand this so it is smooth and we will not get slivers. Give each group a nail file. Ask: "How is this like sandpaper?"
6. Give each student a piece of paper. Have them divide it into four equal parts. Students may do this in their science notebooks. Add one of the following labels to each of the four sections: cutting, folding, sanding and melting. Have students add 1-5 objects in each section depending on what is developmentally appropriate. These can be cut out of magazines, drawn or listed.

## Post-Show Enrichment Activities

### Activity One: Change It!

*Materials: Change It!: Solids, Liquids, Gases and You (Primary Physical Science)* by Adrienne Mason and Claudia Davila

*Procedure:*

1. Read the story *Change It!: Solids, Liquids, Gases and You (Primary Physical Science)* by Adrienne Mason and Claudia Davila. There are many ideas in this book where students can observe changes in matter. You may want to demonstrate some of these as you read.

### Activity Two: Experimenting with Matter

*Materials:* various objects to mass, weights

*Procedure:*

Students will mass an object, such as a banana or connected Lego blocks, on a balance scale.

1. Draw the object in their science notebook. Feel the object and predict the mass. Students may also want to feel the weights (use 1 gram blocks if possible) to help them predict the mass. They can put the object in one hand and the weights in the other to help make their prediction. Next, students will measure the mass of the object and record the mass in their science notebook.
2. Next, students will break it apart, draw the part that they are measuring, predict the part's mass and then mass it and record it in their notebook.
3. Finally, students will re-measure the mass of the original object in pieces. Draw the pieces that they are measuring, predict their mass and then mass it and record it in their notebook.

#### Activity Four: Does Mass Change when the State of Matter Changes?

*Materials:* large ice cubes

*Procedure:*

1. You will need to prepare very large ice cubes ahead of time, one per group.
2. Students will measure the properties of an ice cube including temperature and mass.
3. Allow the ice cubes to melt.
4. Students will measure and record the properties of the liquid water including temperature and mass of the liquid water.
5. Compare the temperature and mass of the water as a liquid and a solid.
6. Discuss differences.

#### Activity Five: Classifying Matter

*Materials:* *What Is the World Made Of? All About Solids, Liquids, and Gases* by Kathleen Weidner Zoehfeld

*Procedure:*

1. Read *What Is the World Made Of? All About Solids, Liquids, and Gases* by Kathleen Weidner Zoehfeld. Students will make a liquid, solid and gas chart in their science notebooks. As you read, they will record examples in the appropriate columns.
2. When you are finished, ask students to discuss in their groups what characteristics they used to classify the matter. How did they decide if something was a solid? Liquid? Gas?
3. Share their ideas as a class and create a chart listing the properties of a solid (visible, definite shape, definite mass, definite volume) a liquid (usually visible, definite volume, definite mass, takes shape of the container) and gas (mostly invisible, no definite shape or volume, and has a definite mass). Definition of matter: takes up space (volume) and has weight or mass.

## Activity Six: Characteristics of Matter

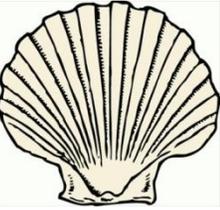
*Materials:* variety of objects, chart

*Procedure:*

1. Give students a variety of objects to observe.
2. Have them group the objects as round or square. Then group them as rough or smooth. Finally, have them group them as flexible or not flexible (rigid).
3. Ask students, "What tools can we use to observe properties of matter?" (senses, scales, thermometers, measuring tape, etc.)
4. Students will observe and record properties of matter. Students will fill in the chart with their observations (see Appendix A-1). With younger students, they may need to complete this one step at a time as a class.

## Appendix

A-1

Matter Example	Solid or Liquid	Shape	Texture	Flexible	Mass
<p style="text-align: center;">Clay Ball</p> 	<p style="text-align: center;">Liquid</p> <p style="text-align: center;">Solid</p>		<p style="text-align: center;">Rough</p> <p style="text-align: center;">Smooth</p>	<p style="text-align: center;">Yes</p> <p style="text-align: center;">No</p>	
<p style="text-align: center;">Pinecone</p> 	<p style="text-align: center;">Liquid</p> <p style="text-align: center;">Solid</p>		<p style="text-align: center;">Rough</p> <p style="text-align: center;">Smooth</p>	<p style="text-align: center;">Yes</p> <p style="text-align: center;">No</p>	
<p style="text-align: center;">Rock or Shell</p> 	<p style="text-align: center;">Liquid</p> <p style="text-align: center;">Solid</p>		<p style="text-align: center;">Rough</p> <p style="text-align: center;">Smooth</p>	<p style="text-align: center;">Yes</p> <p style="text-align: center;">No</p>	