Properties of Matter

**KEY VOCABULARY**
- analyzing: considering information gathered during an experiment
- gas: matter that fills the space it's in, such as air
- investigating: gathering information by observing or testing
- liquid: matter that flows and takes the shape of its container
- matter: anything that takes up space
- observing: using our senses to gather information
- properties: things that can be observed about an object (such as color, shape, weight, size, texture, etc.)
- senses: the body's tools for gathering information (sight, touch, hearing, taste, and smell)
- solid: matter that keeps its shape and size
- temperature: how hot or cold something is
- texture: how something looks or feels

**WELCOME, EDUCATOR!**
You and the children you work with are about to embark on an engaging multimedia experience exploring concepts in Science, Technology, Engineering, and Math (STEM). Sesame Street Little Discoverers: Big Fun with Science, Math, and More is a resource to help you discover exciting new ways to build on children's natural fascination with STEM concepts.

In this topic, children will observe, explore, sort, compare, contrast, and describe objects based on their properties.

**HELP CHILDREN TALK ABOUT PROPERTIES OF MATTER:**
- Properties of matter like color, size, texture, and shape form the foundation for science and engineering.
- Matter is anything around us that takes up space (furniture, people, food, toys).
- Matter can be found in three common states: solids, liquids, and gases.
- Children investigate and discover the properties of matter by using their senses as they observe and describe an object's color, size, texture, and shape.

For more fun ideas, videos, and games, check out sesamestreet.org/STEM on your computer or mobile device.
PROPERTIES OF MATTER

Properties of a Playmate

GOAL
Describe different properties of matter – color, size, texture, and shape.

QUESTION
What properties of matter do you want your playmate have?

TIME
20–30 minutes

MATERIALS
» play dough in different colors
» tools to manipulate the play dough, such as plastic forks, spoons, and stamps
» an assortment of materials that can be added to the play dough, such as yarn, craft sticks, milk-bottle caps, etc.
» View and Do chart (one per child)
» crayons

LET'S WATCH: “A PLAYDATE FOR ROCCO”
In the video, Elmo and Zoe want to make a playmate for Zoe’s pet rock, Rocco. They try to make three different playmates by trying out different materials: a balloon, an egg, and a sponge. They discover that the different materials have different properties, and only the sponge makes a good friend for Rocco.

LET'S TALK ABOUT IT
After you watch the video together, ask some questions to prompt a discussion.
» “What was the problem Elmo and Zoe were trying to solve?”
» “What did they learn about the balloon? The egg? The sponge?”
» “Which material made a good friend for Rocco and why?”
» “Can you think of another object that has weight, is round, and doesn’t break?”

LET'S DO AN ACTIVITY
1. Hold up a ball of play dough and encourage children to describe it. Talk about its color, shape, size, and texture. Explain that these are all properties of the ball.
2. Say, “We will be creating little friends just like Elmo and Zoe did for Rocco. First, let’s plan what properties our friends will have.”
3. Show the children the materials they will use to make their playmates.
4. Encourage children to think about what they want their playmates to look like. Have children share which properties they want their playmates to have. Ask, “Will your playmate have the same properties as Rocco?”
5. Encourage children to build their play dough friends.
6. After children are finished, have them draw their friends on their charts.
After children have made their friends, encourage them to fill in the properties of their playmate using the top of the chart (fill in the color with a crayon and draw the shape). Next, have them draw their friend on the bottom of the chart.

<table>
<thead>
<tr>
<th>Properties of My Friend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Shape:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Draw your friend:</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
PROPERTIES OF MATTER

A Mystery Mixture

GOAL
Describe properties of matter.

QUESTION
How can the properties of two things change when they are mixed together?

TIME
20–30 minutes

MATERIALS
For each small group of children:
» 1 cup cornstarch
» 1½ cups water
» 1 shallow bowl or deep tray
» 1 spoon or ice-pop stick
» 1 small, air-tight container
» smock (one for each child)
For the educator:
» Activity Chart
» masking tape
» marker

In this activity, children will investigate properties of matter and what happens when cornstarch and water are mixed together.

STEPS
1. Have children pour the cornstarch into the bowl and take a few minutes to observe it. Say, "Matter is something that takes up space. We have some matter in our bowls. What is it like? What color is it? How does it feel?" List children’s descriptive words on the Activity Chart.
2. Say, "Scientists call these types of words ‘properties.’ We just listed the properties of the matter in your bowls."
3. Then have children observe and describe the water. List their descriptive words on the Activity Chart.
4. Tell children that they will explore the properties of matter again after they mix the cornstarch and water together. Ask them to make a hypothesis about what will happen when the cornstarch and water are combined.
5. Have children mix the water into the cornstarch using the spoon or stick. Encourage them to explore the new substance.
6. Walk around to small groups and ask questions:
   » "What happened when you mixed the two different kinds of matter together?"
   » "How do you describe the _________ [texture, color, shape, smell]"
   "What does it look and feel like?"
   » "Does the mixture have some properties that are the same as the water or cornstarch from before you mixed them?"
7. Have children share aloud some properties of the mixture and include these on the Activity Chart. Then compare and contrast the properties of the cornstarch, water, and mixture.
8. Keep the cornstarch substance in closed containers labeled with a marker and masking tape for children to explore in small groups during the week.

TUBE EXPLORATION
Explore how many properties of paper towel tubes children can think of. Have them use their senses ("I can see that it is brown" "I can feel that it is smooth").
Have children suggest words that describe each type of matter in this exploration. Record their thinking in the chart below. Refer to Example Chart for ideas.

<table>
<thead>
<tr>
<th>Cornstarch</th>
<th>Water</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>white</td>
<td>clear</td>
<td>white</td>
</tr>
<tr>
<td>dry</td>
<td>wet</td>
<td>sometimes hard</td>
</tr>
<tr>
<td>powdery</td>
<td>pours easily</td>
<td>sometimes soft</td>
</tr>
</tbody>
</table>

**EXAMPLE CHART**
**Properties of Matter**

*HELLO, FAMILIES!*

Your child is full of curiosity. She is always observing, questioning, testing her thinking, and collecting information. These are important critical-thinking and problem-solving skills that help set her up for success in Science, Technology, Engineering, and Math (STEM).

**HELP YOUR CHILD TALK ABOUT PROPERTIES OF MATTER**

» Matter is anything around you that takes up space (furniture, people, food, drinks, toys).

» Words we use to describe matter – like “blue,” “heavy,” “fuzzy,” or “sweet” – name its properties.

» Properties of matter can be described using our five senses – touch, hearing, smell, sight, and taste.

» Two common states of matter are: solids (like ice) and liquids (like water).

**TRY THIS AT HOME**

Pick and choose the activities that work best for you and your child.

**Let’s Talk.** Use the words matter, properties, senses, solids, and liquids as many times as you can this week! Say things like, “Let’s use our senses to describe our dinner.” “Can you describe the properties of your backpack?”

**Create a “Feel It” Bag.** Collect a variety of safe household objects and place them in a pillowcase. Have your child close his eyes, pull out an object, and describe as many of its properties as he can about it. Suggest that he use his senses. Ask, “Is the object rough or smooth? Hard or soft? Heavy or light? Big or small?”

**Do a Smell Test.** Put different scented items such as garlic, peppermint, an orange, or a banana into small bags or cups. Have your child close her eyes and guess the food using her sense of smell.

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PROPERTIES OF MATTER

Leaf Sorting

TUBE EXPLORATION
Use paper towel tubes to explore properties of matter. Your child can use a tube as a spyglass to play “I Spy.” She can have you guess what she’s looking at by saying, “I spy something that is red and fuzzy. What is it?”

WATCH “PROPERTIES OF A TUBE”
In the video, Elmo and Abby use their senses to describe the properties of paper towel tubes. They observe that the tubes are straight and round, lightweight, smooth, and light brown.

ACTIVITY
Help your child better understand properties of matter by sorting leaves.

MATERIALS
» 1 bag or bucket for collecting leaves
» different leaves
» Activity Chart
» crayons

STEPS
1. Help your child collect as many different leaves as she can find in her backyard or the local park.
2. Let her remove the leaves from the bag and describe each one to you. Remind her to use her senses and ask, “What color, size, and shape is it? What does it feel and smell like?”
3. Then, play a sorting game. Lay out all the leaves and ask your child to sort them by one of the properties (size, shape, color). You might say, “Put all the big leaves into one pile, and the small leaves into another pile.”

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### Properties of Matter

#### Leaf Sorting

Choose a property, such as size (big/small), color (green, brown, orange), or shape (oval, pointy), and have your child draw the leaves that show that property.

<table>
<thead>
<tr>
<th>Property</th>
<th>Draw leaves here</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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