



Simplify
Science™

Lab Activity

Properties of Matter



Properties of Matter Lab

Standards

2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

Vocabulary

- matter: *everything around us that has weight and takes up space*
- properties: *describe what something is like*
- materials: *different kinds of matter that things are made of*
- temperature: *how hot or cold something is*
- classify: *to sort things based on what they have in common*

Learning Goal

The student will analyze, describe, and classify different kinds of materials by their observable properties.

Success Criteria

- **Criteria 1-** The student accurately describes each material based on the properties of color, texture, hardness, and flexibility.
- **Criteria 2-** The student classifies or sorts the materials based on a chosen property.

Materials

In addition to a pencil and the lab recording sheets, each pair of students will need the following items.

The table below includes the materials that students will use for determining the properties of matter. If you do not have access to the intended materials, alternatives are included below.

Material	Alternative
paper clip	N/A
washer	coin, bolt
pencil	wooden dowel
stick	craft stick, toothpick
playdough	salt dough, modeling clay
plastic block	plastic spoon, plastic toy
rock	N/A
cotton ball	feather
paper	cardboard
sandpaper	rough kitchen sponge
yarn	fabric



Teacher Directions

Properties of Matter Lab

Preparing for the Lab

- Divide students into pairs and provide each student with a copy of the lab recording sheets (pgs. 5-7)
- Ensure that all materials are available and decide how students will be gathering their materials. Depending on the needs of your class, you can divide the materials and have them prepared before the lab.

During the Lab

Lab Introduction and Optional Review

- Display and distribute a copy of the Lab Recording Sheets (pg. 5-7) and let students know that they will be exploring properties of matter in today's lab.
- If students need a quick refresher, remind them that everything around us, such as what and takes up space is made of matter, and that we can classify, or sort, materials based on their properties of color, hardness, texture, and flexibility.

Part A: Determining Properties

- Distribute materials and explain expectations for proper use of materials before, during, and after the lab.
- Read the directions for Lab Part A aloud: "Determine the properties of each material. Record your findings in the table below."
- Read the properties aloud, and explain how students should determine the properties by looking at the color, and circling one of the choices for texture, hardness, and flexibility. Clarify the meaning of any properties as needed.
- Model how to determine the properties of the paper clip and complete that row as a class.
- Direct students to continue moving down the table to determine the properties of each material and record their findings in the chart. Circulate the room and assist, as needed.

Part B: Classifying Materials

- Tell students that they and their partner will now be classifying, or sorting, the materials by one property. They may choose to sort the materials by color, texture, hardness, or flexibility. They should not tell their partner how they are classifying the materials. Once they've sorted the materials into different groups based on their chosen property, their partner should guess how they classified the materials. Then they will switch roles, and the other partner will classify the materials.
- Remind students to write down how they and their partner each classified the materials.

Post-Lab Reflection

- Have students complete the reflection questions independently or with their partner.
- Call on a few students to share their answers aloud for one or both reflection questions.



Teacher Script

Properties of Matter Lab

Preparing for the Lab

- "Today you'll be working with your partner." [*Divide students into pairs.*]

During the Lab

Lab Introduction and Optional Review

- [*Display and distribute a copy of the Lab Recording Sheets (pg. 5-7).*] "In today's lab you will be exploring properties of matter."
- [*Optional Refresher*] "Remember that everything around us that has weight and takes up space is made of matter. We can classify, or sort, materials based on the properties of color, hardness, texture, and flexibility."

Part A: Determining Properties

- [*Distribute materials.*] "Please do not touch the materials until you are instructed to begin. Remember that these materials are tools for learning and should be used appropriately with safety in mind. All materials will be collected at the end of the lab."
- [*Read the directions for Lab Part A aloud.*] "Determine the properties of each material. Record your findings in the table below."
- "Let's take a look at the table. We'll be studying each object to determine its color, texture, hardness, and flexibility. For color, you will write down the color of the object in the table. For texture, you'll circle either rough or smooth. Remember, a brick is rough, and a marble is smooth. For hardness, you'll circle either hard or soft. A chair is hard, and a blanket is soft. For flexibility, you'll circle either flexible or rigid. Flexible means that it's easy to bend without breaking, and rigid means that it's difficult to bend."
- "Let's do the first one together. Looking at the paper clip, can you see what its color is? Let's write 'silver' in the box under color, next to paper clip. Now let's think about the texture. Is the paper clip rough like a brick, or smooth like a marble? It's smooth! Let's circle smooth on our recording sheet. Is the paper clip hard or soft? Hard. Now we need to decide if it's flexible or rigid. Go ahead and see if you can bend it without breaking." [*Give student time to try to bend it.*] "It's flexible!"
- "Continue to move down the chart to determine the properties of each material. Don't forget to record your findings in the chart."

Part B: Classifying Materials

- "Now you and your partner will take turns classifying, or sorting, the materials. Decide who will be 'A' and who will be 'B.'" [*Give students time to decide.*] "Student A will sort the materials into different groups based on either color, texture, hardness, or flexibility without telling their partner which property they're classifying by. Then student B will try to guess which property they classified by! Then you will switch, and student B will sort the materials by a different property, while student A tries to guess. Remember to write down how you each classified the materials under 'Part B' on your lab recording sheet."

Post-Lab Reflection

- "Please complete the reflection questions on your lab recording sheet [*independently/with your partner*]."
- "Who would like to share their answers aloud with the class?"



Name: _____

Lab Recording Sheet

Properties of Matter Lab

Part A: Determine the properties of each material. Record your findings in the table below.

	Color	Texture	Hardness	Flexibility
paper clip		rough / smooth	hard / soft	flexible / rigid
washer		rough / smooth	hard / soft	flexible / rigid
pencil		rough / smooth	hard / soft	flexible / rigid
stick		rough / smooth	hard / soft	flexible / rigid
dough		rough / smooth	hard / soft	flexible / rigid



Name: _____

Lab Recording Sheet

Properties of Matter Lab

	Color	Texture	Hardness	Flexibility
block		rough / smooth	hard / soft	flexible / rigid
rock		rough / smooth	hard / soft	flexible / rigid
cotton ball		rough / smooth	hard / soft	flexible / rigid
paper		rough / smooth	hard / soft	flexible / rigid
sandpaper		rough / smooth	hard / soft	flexible / rigid
yarn		rough / smooth	hard / soft	flexible / rigid

Sample



Name: _____

Lab Recording Sheet

Properties of Matter Lab

Part B: Classify the materials based on their properties.

1. How did your partner classify the materials? _____
2. How did you classify the materials? _____

Reflection: Respond to the question below.

1. How might increasing or decreasing the temperature change the properties of the materials?

2. What could you change about your experiment to learn even more about the properties of matter?



Name: _____

Lab Recording Sheet

Sample Work

Properties of Matter Lab

Part A: Determine the properties of each material. Record your findings in the table below. **note: some answers may vary depending on the material and student interpretation*

	Color	Texture	Hardness	Flexibility
paper clip	silver	rough / smooth	hard / soft	flexible / rigid
washer	silver	rough / smooth	hard / soft	flexible / rigid
pencil	brown	rough / smooth	hard / soft	flexible / rigid
stick	brown	rough / smooth	hard / soft	flexible / rigid
dough	yellow	rough / smooth	hard / soft	flexible / rigid



Name: _____

Lab Recording Sheet

Sample Work

Properties of Matter Lab

	Color	Texture	Hardness	Flexibility
block	yellow	rough / smooth	hard / soft	flexible / rigid
rock	gray	rough / smooth	hard / soft	flexible / rigid
cotton ball	white	rough / smooth	hard / soft	flexible / rigid
paper	white	rough / smooth	hard / soft	flexible / rigid
sand paper	brown	rough / smooth	hard / soft	flexible / rigid
yarn	yellow	rough / smooth	hard / soft	flexible / rigid



Name: _____

Lab Recording Sheet

Sample Work

Properties of Matter Lab

Part B: Classify the materials based on their properties.

1. How did your partner classify the materials? By texture

2. How did you classify the materials? By flexibility

Reflection: Respond to the question below.

1. How might increasing or decreasing the temperature change the properties of the materials?

Increasing the temperature might change some of the materials from a solid to a liquid. For example the plastic block might melt if it got hot enough.

2. What could you change about your experiment to learn even more about the properties of matter?

I could test materials in different states – for example liquids, and gasses. I could also change the temperature of different materials to test how that changes its properties.