

Name: Madison Leintz

Standard

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

Engage

- **Phenomena:** “Today I am going to be showing you a few different pictures. They are going to be everyday objects, but the pictures are going to be zoomed way in. We are going to analyze different things about the pictures, the colors, what we think it might feel like, if we think that it is a material that could bend, and any other properties we may be able to observe. Then we are going to hypothesize what the object might be.”



- “Here is our first picture. Let’s analyze it. What are some things you notice about this picture? What colors do you see? If you can imagine touching this object, what might it feel like? Turn and talk to your neighbor and share what you think this is a zoomed in picture of and why you think that?”
- This picture is actually pages in a book.



- “Here is our second picture. What are some things you notice about this picture? What colors do you see? What might the texture feel like? Do you think this object is flexible and can bend? What are some of your predictions as to what this object might be?”
- This is a picture of corn flakes, the cereal.

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- **Background Knowledge:** “Today we are going to be detectives. We are going to analyze materials based upon their properties. To analyze means to look closely at, paying special attention to details. Properties are the characteristics or traits that we can see or test on an object. Some of the characteristics that we might observe are color, flexibility, hardness, and texture. We know what color means already. Flexibility is its ability to bend. For example, a straw is flexible, it can bend without breaking. What would be an example of something that is not flexible? (rock, pencil, etc.) Now let’s talk about hardness. We test hardness of something using the hardness test. When scientists do this, they use many different tools to test the hardness of an object. It is then given a hardness number based on what tool can leave a scratch mark on the object. Today we are going to be doing the scratch test on objects to test the hardness. Finally, let’s talk about texture. Texture is how something feels. The texture of something can be rough, smooth, fuzzy, etc. Today we are going to be doing learning centers in which you guys will be detectives, analyzing flexibility, texture, and hardness of specific objects and classifying the objects based on the properties you are testing.”

Center 1

- **Challenge:** Classifying Objects by Flexibility (Can the material bend?)
- **Materials Needed:**
 - Pencil
 - Paper
 - Pipe cleaner
 - Marker
 - Tin Foil
 - Wiki Stix
 - Tree Branch
 - Crayon
- **Learning Documents:** Located in Appendix A (students will be writing which category the object falls under on a divided piece of paper)
- **Special Directions:**
 - Special Center Directions (will be posted at the station): Appendix B
 - At this center, students will be testing the flexibility of objects and putting them into one of two categories flexible or not flexible. I will have each item label so they know what it is along with a poster board divided in half, labeled flexible and not flexible. As a group, they will test the flexibility of the object and place it on either side of the poster board. They will also have a piece of paper where they will have to write the name of each item on the corresponding sides.
 - “At the first center, we will be classifying objects by flexibility. First, I am going to go over what you should do at this station. There are the papers that you need laying at the station, as soon as you arrive at the station, grab one, put it on your clipboard, and write your name at the top. As a group, you will be testing the flexibility and placing the objects in either the flexible category or the not flexible category. In order to test the flexibility, you will have to try to bend the item. If the item does not bend, do not keep trying to bend it. The flexible items should bend right away. I do not want any of our materials

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broken, because other groups will have to classify. Once you have decided as a group if the item is flexible or not flexible and placed it on the poster board, you will need to write the name of the object on the corresponding side of your paper. Any questions about the first station?"

Center 2

- **Challenge:** Classifying Objects by Hardness
- **Materials Needed:**
 - Fingernail
 - Penny
 - Cotton ball
 - Coal
 - Piece of Talc
 - Rock Salt
 - Gypsum
 - Quartz
- **Learning Documents:** Appendix C (students will be drawing and labeling a piece of paper ordering items from soft to hard)
- **Special Directions:**
 - Special Center Directions (See Appendix D)
 - At this center, students will be testing the hardness of different materials using their fingernail and if necessary the penny to perform the scratch test. If a scratch mark appears when scratching with their fingernail, it will be lower on the hardness scale. If a scratch mark appears when scratching it with the penny, then it is a little bit harder. If no scratch marks appear when using either object, it will be relatively high on the hardness scale. The students will then try to lay the objects in order from softest to hardest. They will then draw and label the objects on their piece of paper.
 - "At the second center, we will be classifying objects by hardness. Just like at the first center, when you arrive the first thing you need to do is grab the piece of paper, add it to your clipboard, and write your name at the top. As a group, you will be testing the hardness of objects and placing the objects in order from softest to hardest. There is not one definite answer, so go with your gut and try your best. In order to test the hardness of your object, you will perform the hardness scratch test. If a scratch mark appears when scratching with their fingernail, it will be lower on the hardness scale. If a scratch mark appears when scratching it with the penny, then it is a little bit harder. If no scratch marks appear when using either object, it will be relatively high on the hardness scale. Based upon when the scratch appeared, you will try your best to order the objects from softest to hardest. Then draw pictures and record them on your sheet on your clipboard. Any questions about center two?"

Center 3

- **Challenge:** Classifying Objects by Texture
- **Materials Needed:**
 - Felt

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- Tree Bark
- Sandpaper
- Piece of paper
- Smooth Book
- Crinkled up Tin foil
- Rock (rough rock)
- **Learning Documents:** Appendix E (students will be writing the items in the corresponding circle diagram spot)
- **Special Directions:**
 - Special Center Directions (See Appendix F)
 - Students will be touching and feeling the objects in the center. They will then be writing the item in one of the spots on the circle diagram. The different textures might be smooth, rough, and bumpy. They will then sort the objects into a smooth category, rough category, and bumpy category in a triple circle diagram as a group.
 - “At this center, we will be classifying objects by texture. First, when you get to the station, again you are going to grab a paper, add it to your clipboard and write your name on it. Then, you will be feeling each object in the center and putting it in the corresponding part of the circle diagram based on characteristics of the objects center. For example, some items might be smooth, some might be rough and bumpy, etc. Once you have gone through each object and sorted the objects based on characteristics, make sure everyone in the group is done. Then using the large triple circle diagram sort the objects into whatever category they might fit. Discuss why they would fit in that category. Any questions about this center?”

Wrap-Up Session

- **Challenge:** Mystery Items (Can we classify an object without seeing it?)
- **Materials Needed:**
 - Mystery Objects
 - Brown Bags
 - Tree Branch
 - Colored Pencil
 - Large Eraser
 - Cleaning Sponge
- **Learning Documents:**
 - Appendix G (Each student will get a sheet of paper where they will be highlighting properties. They will also write down their prediction as to what the object is)
- **Special Directions:**
 - Students will be in groups. They will reach in their bag and touch their object. They will feel the texture, flexibility and should be able to get a pretty good idea of the hardness of the object from touching it. They will then write down properties and write down their prediction as to what the object is. We will then gather back as a class and they will share their predictions and why they made that prediction. Finally, we will pull the objects out of the bag checking our properties of the objects in the bags.

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Big Idea

- **Science Content:** The science content that the students will be learning is about classifying objects. They will learn how to do the scratch test to test for hardness. They will learn how to test for flexibility, and how to classify things based on texture. They will have to be able to observe and test for specific properties of items. Before doing the above centers, we would learn about classification in a more broad sense. We will read about how and why scientists use classification in their job as scientists. We could also learn about classifying rocks by their properties, classifying animals by their characteristics, etc.
- **Learning Supports:**
 - **Extra article to support learning**
 - More about the hardness test:
https://kids.kiddle.co/Mohs_scale_of_mineral_hardness
 - **Books that support learning**
 - How Things Are Different by Katherine Follett
 - **Vocab**
 - Material
 - Properties
 - Observe
 - Analyze
 - Flexibility
 - Color
 - Hardness
 - Texture

Assessment Plan:

- **Formative:** Collect all graphic organizers and learning documents that they completed throughout the stations to check for understanding and to assess their learning. I will also be actively progress monitoring throughout the learning centers. Finally during the wrap up challenge they will be naming properties of the materials which will be used as a formative assessment.
- **Summative:** Students would be given a standard checkpoint after practicing with classification by properties for more time. See the checkpoint in Appendix H.

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Appendix A

Flexible

Not Flexible

Name:

Center #1:

Classifying Objects by Flexibility

1. Add the Center 1 sheet to your clipboard and write your name on it.
2. As a group, test your items for flexibility.
3. Sort your items on the poster board, flexible or not flexible.
4. Write your items in the correct column on your paper.

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Appendix C

Draw a picture and label your items from softest to hardest.

Softest

Hardest

NAME: _____

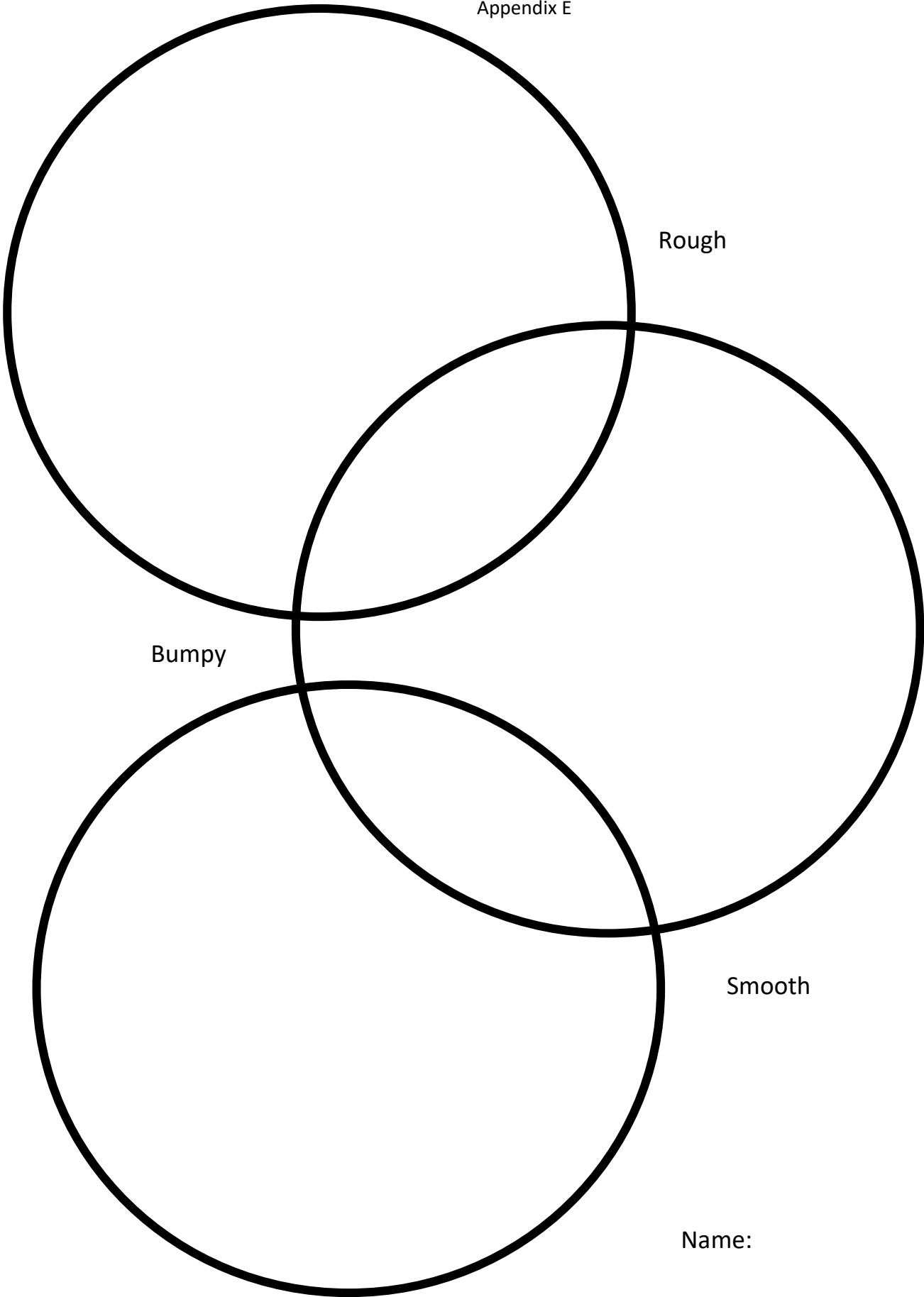
Center #2

Classifying Objects by Hardness

1. Add the Center 2 sheet to your clipboard and write your name on it.
2. As a group, test your items for hardness by performing the scratch test.
(Remember if scratch marks do not appear, the item is harder)
3. Sort your items from softest to hardest.
4. On your sheet, draw and label each picture from softest to hardest.

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Appendix E



Rough

Bumpy

Smooth

Name:

Center #3:

Classifying Objects by Texture

1. Add the Center 3 sheet to your clipboard and write your name on it.
2. Touch each of the objects to classify the texture, put the name of the object in the correct part of the circle diagram.
(rough, rough & bumpy, smooth & bumpy, smooth)
3. Compare diagrams with group members.
4. Using the large circles, sort the actual items by texture.

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Appendix G

Mystery Classification

highlight characteristics

I think the texture of my object is...

smooth bumpy rough

I think the hardness of the object is...

soft or hard

I think my object is..

flexible or not flexible

I think my mystery object is _____.

My mystery object is _____.

Properties of my object now that I have taken it out of
the bag include:

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Appendix H

2-PS1-1 Checkpoint

Name: _____

1. When classifying objects, we observe or sort them by their _____.
 - a. Characteristics
 - b. Properties
 - c. Features
2. When classifying an object based upon hardness, we need to use a _____ test.
 - a. scratch
 - b. smell
 - c. written
3. When classifying objects, there are many different properties we need to test/observe, which of these is not a characteristic we typically classify an object by?
 - a. Hardness
 - b. Texture
 - c. Taste

4. How do we classify objects?

5. When we are classifying objects by their properties, do we usually classify objects after looking at one property? Why or why not?

6. Describe the properties of a pencil. Discuss at least four different properties of a pencil.

7. Describe the properties of a stick. How would a stick be classified compared to how a pencil would be classified? What properties are the same? What properties are different?

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