

TITLE: Understanding Physical Science: Learning to Classify Matter (Taken from Gateways to Science Gr. 4)

AUTHOR:

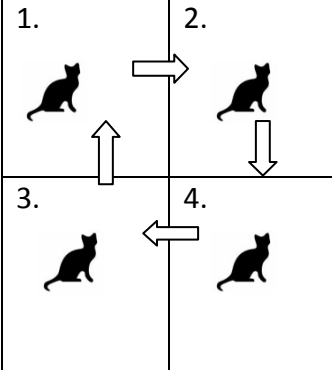
TEAM MEMBERS:

DATE LESSON TO BE TAUGHT:

GRADE LEVEL: 4

CONCEPT(s): Physical properties are important aspects to all branches of science. In addition, all matter has physical properties that can be observed through the senses- feeling, hearing, seeing, smelling, and tasting- as well as through measurement performed by tools.

OBJECTIVES The student will be able to:	Evaluation Question for each Objective					
Collect and record data using simple tables and graphs.	<table border="1" data-bbox="743 968 1372 1230"> <thead> <tr> <th data-bbox="743 968 1068 1020">Column A</th> <th data-bbox="1075 968 1372 1020">Column B</th> </tr> </thead> <tbody> <tr> <td data-bbox="743 1029 1068 1230"> Rose Cherry Cardinal Strawberry </td> <td data-bbox="1075 1029 1372 1230"> Lettuce Frog Grass Broccoli </td> </tr> </tbody> </table> <p data-bbox="743 1272 1372 1493">The physical property used to classify the objects into the columns is most likely</p> <p data-bbox="935 1352 1081 1493"> A. Size B. Odor C. <i>Color</i> D. Texture </p>		Column A	Column B	Rose Cherry Cardinal Strawberry	Lettuce Frog Grass Broccoli
Column A	Column B					
Rose Cherry Cardinal Strawberry	Lettuce Frog Grass Broccoli					
Describe the physical properties of an object using the senses, excluding taste.	Assessed in the engagement activity.					
Classify objects into groups based on observations of their physical properties	Which of these items is most likely to be classified in Column A? F. Ripe Tomato G. Soil H. Spinach J. Banana					

Identify a method of organizing data	What type of chart was used to organize this information?
Identify the following actions when performed on an object: translation, reflection, and rotation.	<p>Which of the following terms correctly describes the diagram below?</p>  <p>Rotation Transcription <i>Translation</i> Reflection</p>
Define matter.	<p>Matter is defined as</p> <p>A. the stuff that all things are made. B. an argument C. an observation D. a method to organize information</p>

Texas Essential Knowledge and Skills (TEKS)

4.1. Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:

- A. Demonstrate safe practices during field and laboratory investigations;

4.2. Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:

- B. collect information by observing and measuring;
- C. analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
- D. communicate valid conclusions; and

4.7. Science concepts. The student knows that matter has physical properties. The student is expected to:

- B. conduct tests, compare data, and draw conclusions about physical properties of matter

VOCABULARY

Matter: the stuff that all things are made.

Physical property: an observation of matter that may be made by using the five senses.

T-chart: a method of organizing information into two categories drawn in a T-shape.

MATERIALS LIST and ADVANCED PREPARATIONS:

*Objects can be substituted

Engagement Activity:

- Container to hold film canisters
- Prepared *film canisters (1 per student, and 1 for the instructor)
- *Cotton balls (1 per film canister)
- *2 Spray air fresheners or scented oils with distinct fragrances

Exploration Activity:

- Lab card, BLM 1
- Collection of rocks (of varying size, shape, color, etc.)
- Pipettes
- Cup of water
- Paper towels
- Large chart paper or poster board
- Markers
- Beaker
- Pipette

Elaboration:

- “Slide, turn, flip” Activity packet
- Ink pads (1 for each group)
- Stamps (1 for each student)

Safety materials:

- Goggles

SAFETY (for science lesson plans only):

Students must be instructed on the proper behavior when performing laboratory experiments. During the engagement activity, students must be instructed on wafting when smelling a mysterious object.

ENGAGEMENT		
What the teacher will do:	Eliciting Questions/ Student Responses:	What the Students will do:
Prepare before lesson: Using half of the cotton balls, lightly spray with one air freshener, or dip in one of the oil samples. Place cotton balls in film canisters, without labels, and snap lids onto the canisters. Repeat with the remaining half of the cotton balls with the other air		

<p>freshener or oil.</p> <p>Label the canister for the instructor with “wafting”, and use as a model for wafting.</p>						
<p>Allow students to select a canister of their choice.</p>		<p>Students will select a canister and await further instruction before opening.</p>				
<p>Tell students the contents of the canisters are not all the same. Their objective is to find the other students that have the same contents in their canisters as they do without talking to one another. Once they do so, they should all collect into groups.</p>		<p>When instructed to do so, students will open their canisters and make observations. Eventually students will begin wafting one another’s contents and create two groups, separated by the scent of the contents of their film canister.</p>				
<p>At the end of the activity, have the students answer questions.</p> <p>Create a T-chart with the class on the board. (*Put the name of the scents in for Scent 1 and Scent 2).</p> <p>After the scents have been identified, identify the organizer as a T-chart. Have students place their names under the appropriate column.</p> <p>Explain the purpose of using a T-chart.</p>	<p>How many groups did you form? <i>Two.</i></p> <p>Which of your five senses did you use to find your group? <i>The sense of smell.</i></p> <p>How are you sorted or grouped? <i>According to the scents of the canisters.</i></p> <table border="1" data-bbox="581 1291 943 1480"> <thead> <tr> <th><i>Scent 1</i></th> <th><i>Scent 2</i></th> </tr> </thead> <tbody> <tr> <td style="height: 50px;"></td> <td style="height: 50px;"></td> </tr> </tbody> </table> <p>If you have scent 1, line up at the board and write your name under the column labeled “scent 1”. If you have scent 2, line up at the board and write your name under “scent 2”.</p> <p>The chart we’re using is called a T-chart. The</p>	<i>Scent 1</i>	<i>Scent 2</i>			<p>Students answer the questions asked by the instructor.</p> <p>Students will line up and place their names under the correct column.</p>
<i>Scent 1</i>	<i>Scent 2</i>					

	purpose of using a T-chart is to organize information into 2 categories.	
--	--	--

TRANSITION

We're going to practice organizing materials. I will give you a collection of rocks and you are responsible for organizing them into groups using the T-chart you were just introduced to.

EXPLORATION

What the Teacher Will Do	Eliciting Questions/ Student Responses	What the Students Will Do
<p>Pass out a "Classifying Rocks" sheet to each student. Additionally, give each group a collection of rocks to be observed.</p> <p>Have students discuss their T-chart with members of their group.</p>	<p>With the sheet being passed out, you must work individually to create a T-chart of your rocks.</p> <p>Now, in your groups, share the charts you created with one another. What about your charts is the same? What about them is different?</p> <p>What tool did you use to put small amounts of water on the rocks? <i>A pipette.</i></p> <p>What happened when you put water on the rocks? <i>Answers may vary. (The water stayed on top of the rock, the water was absorbed by the rock, the water slid off of the rock, etc.)</i></p> <p>What senses did you use to classify your rocks? <i>Sight and Touch.</i></p>	<p>Students will work individually creating a T-chart.</p> <p>Students will provide answers to the instructor's questions.</p>

	How did your group classify the rocks? <i>Answers may vary.</i>	
--	---	--

TRANSITION

Now that you have experience classifying objects, lets read a short passage about matter.

EXPLANATION

What the Teacher Will Do	Eliciting Questions/ Student Responses	What the Students Will Do
Pass out “Physical Properties of Matter” Passage and questions worksheet.	We’re going to read the short passage as class. I need a volunteer to read aloud.	A student will read aloud as called upon while other students follow along silently.
Allow students to complete journal activity.	You are responsible for completing the journal activity at the end of the passage.	Students will complete the writing assignment silently.

TRANSITION

From the passage, what is matter? *Matter is the stuff that all things are made.* What is a physical property? *A physical property is an observation of matter that may be made by using the five senses.* Now we’re going to investigate what kind of changes can occur if we perform an action to an object.

ELABORATION

What the Teacher Will Do	Eliciting Questions/ Student Responses	What the Students Will Do
Introduce translation, rotation, and reflection. Demonstrate sliding using an object in the classroom.	We’re going to look at three types of changes we can make to an object, but first we must understand what they mean. Translation means to slide. (Say this while holding an object. Slide the object across a surface or in front of the class.) Can everyone repeat the definition and the action I’m doing using your pencil. <i>Translation means to slide.</i>	Students will slide their pencil on their desk.

Group Activity: Classifying Rocks

1. Make observations of the rocks.
2. Use the pipette to place drops of water on the rocks. Make observations.
3. Discuss how to classify the rocks into groups.
4. Create a T-Chart.
5. Label the columns of the T-chart.
6. Sort the rocks and place them in the correct column.
7. Draw and label a diagram of the T-chart.

Physical Properties of Matter

Matter is the “stuff” that things are made of. Look around you. Water is made of matter. Rocks are made of matter. You are made of matter. Matter is everywhere.

Scientists observe matter by using their senses. You used your hands to touch the rocks. You used your eyes to look at the rocks. You used your nose to smell the cotton balls- you are using your senses just like a scientist!

Physical Properties of matter are observed with the five (5) senses. Physical properties include: color, size, shape, odor, and texture. You used the physical properties of the rocks to put them

into groups, or classify them. Some groups used size and color to classify the rocks. Other groups classified the rocks by color. Both size and color are physical properties of the rocks.

Making observations of the physical properties of matter is one important way scientists study the natural world. You, like a scientist, can observe the world around you.

Making Observations

Observe your shoes. Do they have buckles or laces? Do they consist of one color or more? Answers to questions such as these describe the physical properties of your shoes.

Write a paragraph describing your shoes.

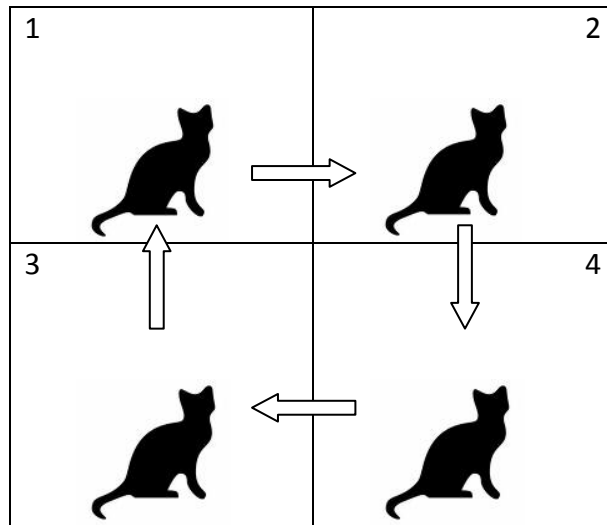
Name _____

Date _____

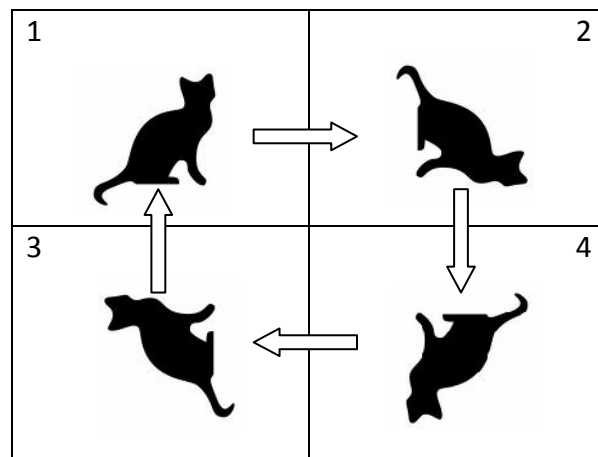
Slide, Turn, and Flip

Slide, turn, and flip are all terms you should be familiar with. Today we will learn new ways to express these actions. Translation means to slide. Rotation means to turn. Reflection means to flip.

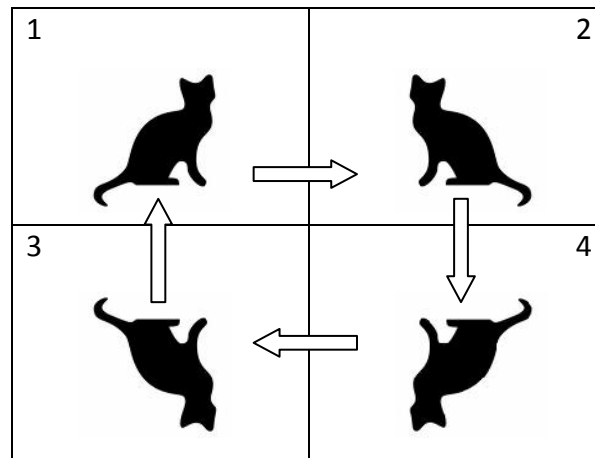
TRANSLATION = SLIDE



ROTATION = TURN

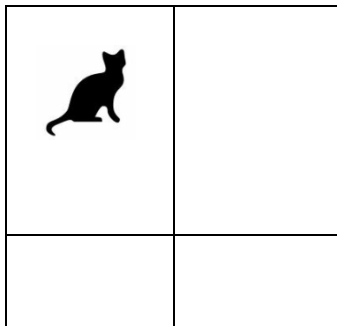


REFLECTION = FLIP



On the attached sheet of paper, do the following:

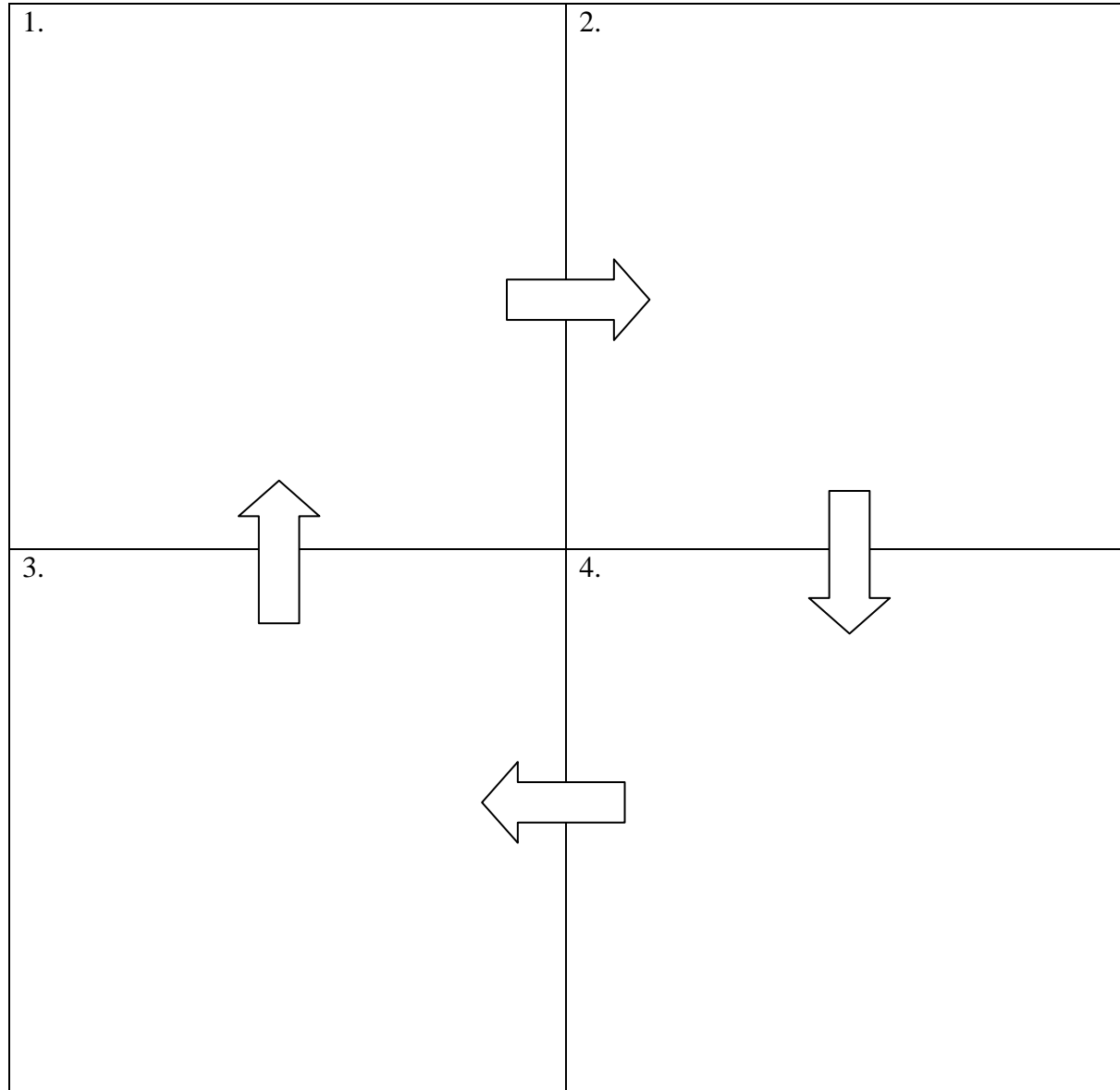
1. Think about the meaning of the term at the top of the page.
2. Using the stamp of your choice, press the stamp on the ink pad to get ink and press it into place in the first square as shown in the figure below:



3. For the second square perform the action designated by the term on the top of your page.
4. Continue this process for the third and fourth squares.
*Be sure the entire process results in the original image being the resulting image.

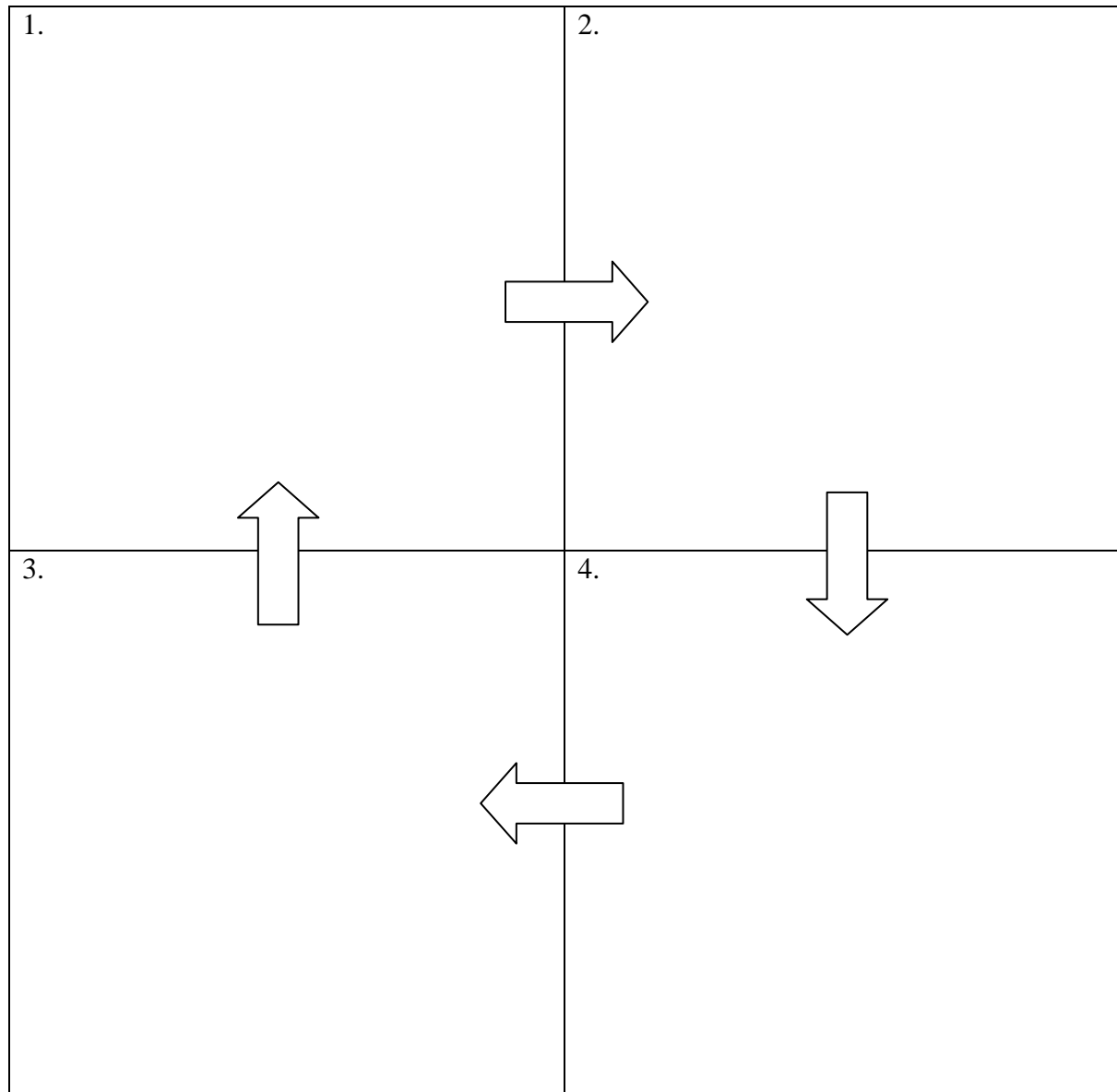
Name _____

TRANSLATION



Name _____

ROTATION



Name _____

REFLECTION

