

# Properties of Matter

## Teacher Facilitation Notes

### In General . . .

- Project the slide deck in edit mode—do not show it as a slideshow.
- Hide the speaker notes before projecting. (View/Show Speaker Notes)
- Hide the filmstrip to the left. (View/Hide Filmstrip.)
- Hide the toolbar. (Click on the up arrow at the right end of the tool bar.)
- Call on students to read the various content shown on slides.
- For each investigation, assemble the needed materials for each group and place in a central location for ease of distribution.
- Duplicate copies of the data sheets for each student.

### Materials Needed Per Group:

#### Explore 1 Temperature:

3 foam cups

2 Celsius thermometers

Hot water

Paper towels

2 graduated cylinders (100 mL)

Pipette

Cold water

#### Explore 2 Mass:

Book

Full bottle of water

Pair of scissors

Digital scale OR Triple beam balance

Box of crayons (24 crayons)

Highlighter

Unsharpened pencil

#### Explore 3 Magnetism:

3 Beakers (100 mL)

Vegetable oil

9 Paper clips

Craft Stick

Water

Light Corn Syrup

Magnet

Paper towels

#### Explore 4 Relative Density:

Large, clear bowl or tub

Avocado

Grape

Small tomato

Paper towels

Apple

Clementine orange

Lime

Water

#### Explore 5 Physical State:

Large, clear bowl or tub

Water

Push pin

3 balloons

Paper towels

Sharpie™

# Properties of Matter

## Teacher Facilitation Notes, p. 2

### Materials Needed Per Group, continued:

#### Elaborate

Highlighter

Small bottle of glue

Water

Balance or Digital scale

Paper towels

Battery, AA

Bowl or container for testing objects

Thermometer

Magnet

### Other Materials

Student Recording Sheets

Pencils

Student Summative Evaluation

### Engage

- Read and discuss each slide as desired. On the title slide, point out the objective and discuss what it means.
- Remind students that matter is anything that has mass and takes up space.
- Read and discuss the physical properties students will be investigating during this lesson.

#### Explore 1: Temperature

- Make sure students understand how to read the thermometers.
- Be sure to have ice cold water and fairly warm water ready for the investigation.
- Groups can perform the investigation independently or work together through the steps simultaneously.
- Discuss as desired.

#### Explore 2: Mass

- Read and discuss the introductory slide. Be sure to point out the different tools for measuring mass.
- Depending on students' ability level, either work through each step with the whole class or let groups work independently.
- Lead a class discussion using the questions on the final mass slide.

**NOTE:** The problems for the triple beam balance vary each time you use the application.

# Properties of Matter

## Teacher Facilitation Notes, p. 3

### Pan Balance Answer Key

Apple-10 g

Donut-5 g

Sundae-14 g

Tennis Ball-19 g

Snail-18 g

Cake-8 g

Football-21

Soccer Ball-19 g

Mouse-17 g

Cupcake-6 g

Grapes-11 g

Strawberry-3 g

Frog-24 g

### Explore 3: Magnetism

- Read and discuss the introductory slide.
- Depending on students' ability level, either work through each step with the whole class or let groups work independently.
- Students should observe that the paper clips in the water and the vegetable oil were quickly attracted to the magnet and moved up the side of the beaker easily. However, the paper clips in the corn syrup were harder to attract and move up the side of the beaker.

### Explore 4: Sink or Float?

- Read and discuss the introductory slide.
- Remind students that this is a science investigation and not a play time. They should not play with the water in any way.
- Depending on students' ability level, either work through each step with the whole class or let groups work independently.
- Discuss as desired.

### Explore 5: Physical State

- Read and discuss the introductory slide.
- Remind students of science safety rules that must be followed when using the push pin.
- At least 2 days before the investigation, fill 1 balloon for each group with water and freeze them. On the day of the investigation, fill 1 balloon with water for each group. Blow up a balloon for each group and tie off. Place the three balloons in the tub or large bowl for each group. Put a #1 on the balloons filled with air, a #2 on the balloons filled with water and a #3 on the balloons filled with air.
- Have groups complete the activity. Discuss.
- Read and discuss the final slide about changing states of matter.

# Properties of Matter

## Teacher Facilitation Notes, p. 4

### Explain

- Call on volunteers to read each paragraph of the explanation.
- Emphasize the vocabulary terms as students read the passage.
- Have students match the definitions and tool/method used to determine the physical properties of each object.
- Discuss as desired.

### Elaborate

- Depending on students' ability level, either work through each step with the whole class or let groups work independently.
- Discuss the investigation as desired.
- Play a Password game with the students. Options:
  - The whole class gives clues to the guesser.
  - Divide the class into 4 groups. Groups take turns having a guesser and giving clues. Points are awarded for a correct answer.

### Evaluate

- Have students classify the objects according to their physical properties. They must infer if the object is heavier than a science notebook and if it is cool. Accept all reasonable answers students can justify. (For example, a student might say the toy cat will float if it is made of rubber—a rubber cat bath toy.)
- Let students complete the quiz independently.
- Discuss evaluation activities as desired.

# Physical Properties of Matter

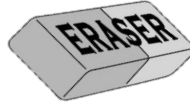
Name: **KEY**

## Evaluation

1. Think about the physical properties of the objects below.



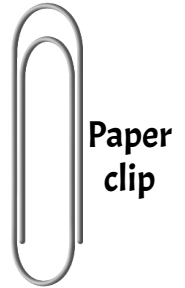
Wooden Ruler



Eraser



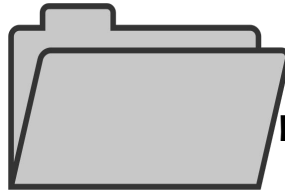
String



Paper clip



Pencil



File Folder



Iron Nail

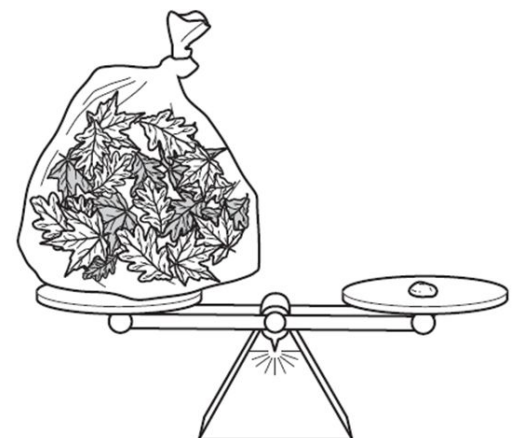


Foam Cup

All of the physical properties can be used to classify these objects into more than one group, EXCEPT–

- A Magnetic and nonmagnetic objects
  - B** Physical state–solid, liquid, or gas
  - C Objects that sink in water and objects that float
  - D Objects with mass and objects with no mass
2. When ice cream is left out of a freezer, the ice cream changes from a –
- F solid to a gas
  - G gas to a liquid
  - H** solid to a liquid
  - J liquid to a gas
3. Based on the illustration, the bag of leaves has–

- A less mass than the pebble
- B** the same mass as the pebble
- C the same volume as the pebble
- D less volume than the pebble



# Physical Properties of Matter

Name: **KEY**

## Evaluation

4. A student makes a list of some objects she can see in her classroom

### Classroom Objects

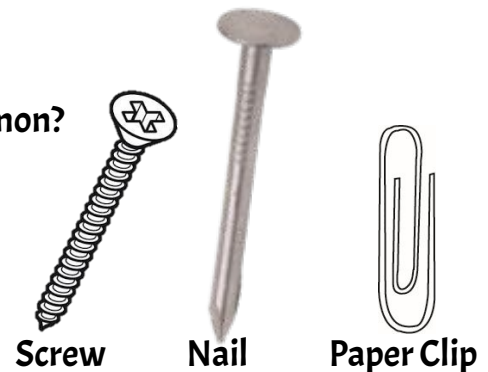
1. Wooden door
2. Plastic ruler
3. Metal stapler
4. Rubber band

What physical property is the same for all four objects?

- F Mass
- G Relative Density
- H** Physical state
- J Magnetism

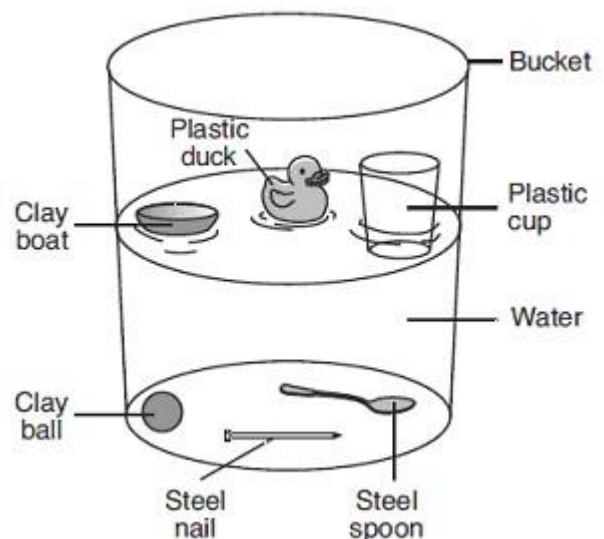
5. What physical properties do these objects have in common?  
Mark all the answers that apply.

- A Mass
- B** Magnetism
- C** Relative density
- D** Physical state



6. Which of the following objects sink in the water

- F** Clay ball
- G Clay boat
- H Rubber duck
- J** Steel spoon
- K Plastic cup



# Physical Properties of Matter

Name: \_\_\_\_\_

## Physical Property: Temperature

### Question

When warm and cold water are mixed, how will the temperature of the mixture compare to the beginning temperatures of the water?

### My Hypothesis

### Temperature Data

Temperature of Cold Water	
Temperature of Warm Water	
Temperature of Mixture	

**My Observations:** (Describe how the temperature of the mixture compares to the beginning temperature of the cold water and the beginning temperature of the warm water.)

**My Conclusions:** (Was your hypothesis correct?)

# Physical Properties of Matter

Name: \_\_\_\_\_

## Physical Property: Mass

### Question

What is the mass of six common classroom objects?

### Predicted Object with Most Mass

### Explanation

### Mass of Classroom Objects

Book	
Box of crayons	
Full water bottle	
Highlighter	
New pencil	
Pair of scissors	

1. Which object has more mass than the pair of scissors but less than the bottle of water?
2. List the objects in order from greatest to least mass.

**My Conclusions:**



# Physical Properties of Matter

Name: \_\_\_\_\_

## Physical Property: Magnetism

### Prediction

How do you think the thickness of each liquid will affect the movement of the paper clips when a magnet is moved along the side of the beaker?

### Observations

1. Beaker of water
2. Beaker of cooking oil
3. Beaker of light corn syrup



**My Conclusions:**

# Physical Properties of Matter

Name: \_\_\_\_\_

## Physical Property: Sink or Float

### Question

Which fruits have less relative density than water?

### Relative Density: Sink or Float?

	Prediction	Result
Apple		
Avocado		
Clementine orange		
Grape		
Lime		
Tomato		

### Claim

(Your answer to the question.)

### Evidence

(Use data from the investigation to explain your claim.)

### Reasoning

(The scientific explanation of relative density)

# Physical Properties of Matter

Name: \_\_\_\_\_

## Physical Property: State of Matter

### Question

How can matter be classified using its physical state?

#### Balloon #1

Properties:

What happened when the balloon popped?

State of matter inside the balloon:

#### Balloon #2

Properties:

What happened when the balloon popped?

State of matter inside the balloon:

#### Balloon #3

Properties:

What happened when the balloon popped?

State of matter inside the balloon:

### Conclusions

# Physical Properties of Matter

Name: \_\_\_\_\_

## Explain

### Directions

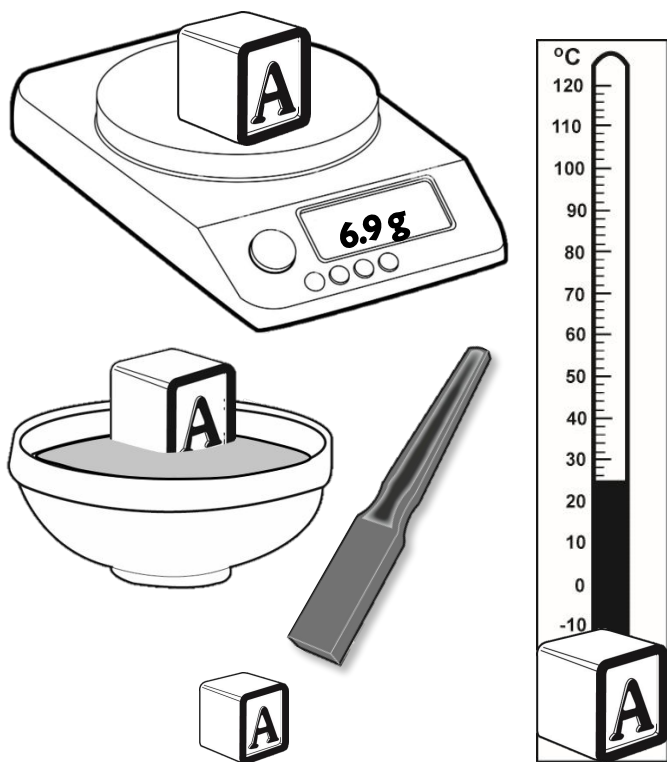
Record the letters of the definition and the tool or method of testing that matches each physical property.

### Vocabulary Practice

Term	Definition	Tool
Temperature		
Mass		
Magnetism		
Relative Density		
Physical State		

### Properties of Matter

Use the illustrations to describe the properties of the block.



# Physical Properties of Matter

Name: \_\_\_\_\_

## Elaboration

### Question

What physical property do a highlighter, a battery, and a bottle of glue share?

### Prediction

### Mass of Classroom Objects

	Highlighter	Battery	Bottle of Glue
Temperature			
Mass			
Magnetism			
Relative Density			
Physical State			



### My Conclusions:

# Physical Properties of Matter

Name: \_\_\_\_\_

## Evaluation

**Classify the objects according to their physical properties. (An object may go in more than one category!)**

**Temperature**  
(Very cold)

**Mass**  
(Heavier than science notebook)

**Magnetism**  
(Will stick to magnet)

**Relative Density**  
(Will sink in water)

**State**  
(Solid)

**State**  
(Liquid)

**State**  
(Gas)

# Physical Properties of Matter

Name: \_\_\_\_\_

## Evaluation

1. Think about the physical properties of the objects below.



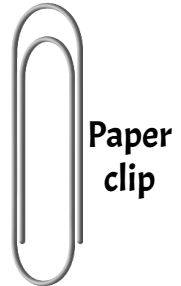
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Eraser



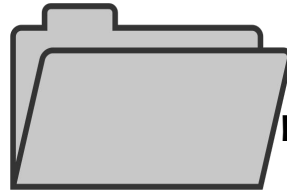
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Paper clip



Pencil



File Folder



Iron Nail

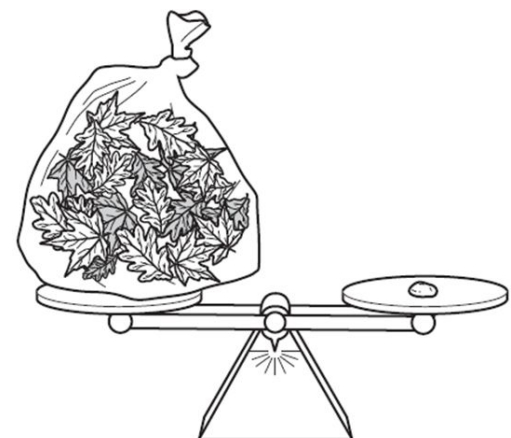


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# Physical Properties of Matter

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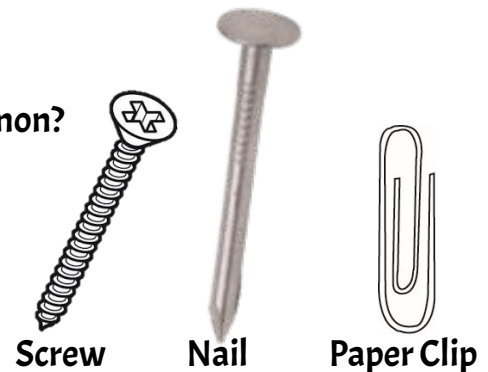
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5. What physical properties do these objects have in common?  
Mark all the answers that apply.

- A Mass
- B Magnetism
- C Relative density
- D Physical state



6. Which of the following objects sink in the water?  
Choose two answers.

- F Clay ball
- G Clay boat
- H Rubber duck
- J Steel spoon
- K Plastic cup

