

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 tool bar. (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:

2 clear, plastic glasses

Sharpie^R marker

Cold water

Thermometer

Timing device

Paper towels

Warm water

Explore 2 Mass:

Unsharpened pencil

Full bottle of water

Pennies, about 100 (in baggie)

Scissors

Empty foam cup

Balance scale

Science notebook

Digital scale

Explore 3 Magnetism:

Aluminum foil

Craft stick

Plastic bead or cube

Bolt

Nail

Penny

Key

Paper clip

Magnet

Explore 4 Sink or Float:

Large bowl

Penny

Pencil

Unshelled Pecan

Water

Craft stick

Eraser

Grape

Paper towels

Paper clip

Unshelled Walnut

Elaborate

Small plastic bowl

Paper towels

Water

Waxed paper

Ball of play-doh

Tape

Other Materials

Student Recording Sheets

Large, clear pitcher or beaker

Pencils

Orange

Properties of Matter

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Engage

- Read and discuss each slide as desired.
- Remind students that matter is anything that has mass and takes up space. As students call out examples of matter, type them in the text box.
- Ask students if they have ever used a balance such as the one shown to find the mass of objects.

Explore

- Read and discuss the introductory slides.
- Point out any key terms and tools.
- Have students think about their pencil again. Ask: How might you find out if your pencil is magnetic or sinks/floats? How would you find the mass of your pencil?

Explore 1: Temperature

- Read and discuss the introductory paragraph. Type the temperatures shown as students read each thermometer.
- 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 slides.
- Have groups work as you read each step. Give time between steps for them to find the mass of the objects in pennies and in grams.
- Lead a class discussion using the questions on the final mass slide.

Explore 3: Magnetism

- Read and discuss the introductory slides.
- Be sure the bolts, nails, paper clips, and keys are attracted to a magnet.
- Place the objects in a snack baggie for each group.

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Explore 4: Sink or Float?

- Read and discuss the introductory slides.
- Remind students that this is a science investigation and not a play time. They cannot eat any of the materials or play in the water.
- Have groups work as you read each step. Allow time for them to make their predictions and test each object as you read the steps.
- After completing the investigation, lead a class discussion on what they observed.

Explain

- Call on volunteers to read each paragraph of the explanation.
- Emphasize the vocabulary terms as students read the passage.
- Discuss as desired.

Elaborate

- Conduct a class demonstration:
 - Show students an orange with the peeling still on. Ask if they think the orange will sink or float? Discuss. If desired, find the mass of the orange and record on the board.
 - Gently place the orange in the container of water. (It should float!) Discuss.
 - Ask students if they think the orange will still float if you peel it. Discuss.
 - Peel the orange. If you previously found the mass of the unpeeled orange, find the mass of the peeled orange and record on the board. Gently place it in the water. (It should sink!)
 - Have students brainstorm why the unpeeled orange floats and the peeled orange sinks. If desired, drop the peeling in the water. Students should observe that the peeling floats by itself. (This actually occurs because of air pockets in the peeling.)
- Have groups complete the clay boat activity independently. If needed, make suggestions about shapes, i.e., roll it like a hot dog; flatten it like a pancake; etc.
- Discuss as desired.

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Evaluate

- Have students write a paragraph describing the physical properties of the apple. They can use the student data sheet or write in their science notebooks. They must include the temperature and mass of the apple plus tell if it is magnetic and sinks or floats in water.
- Let students complete the quiz independently.
- Discuss evaluation activities as desired.

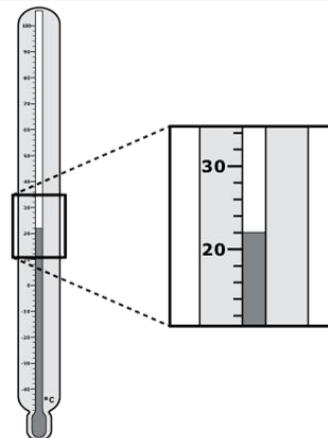
Physical Properties of Matter

Name: **KEY**

Evaluation

1. What temperature is shown on the thermometer to the right?

- A 34°C
- B 25°C
- C 22°C**
- D 21°C



2. Some students tested different objects to see if they were magnetic or nonmagnetic. Their results are shown in the table.

Magnet Sort

| Objects attracted to a magnet | Objects not attracted to a magnet |
|-------------------------------|-----------------------------------|
| Iron nail | Plastic straw |
| Steel ring | Woolen yarn |
| ??? | Rubber band |

Which of the following objects should be placed in the column of objects attracted to a magnet?

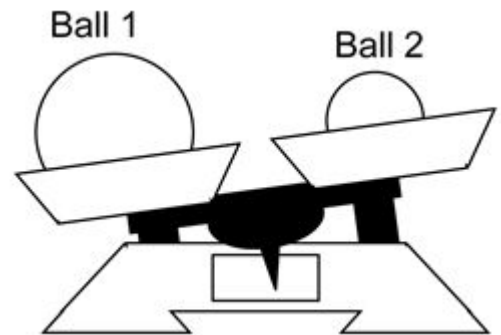
- F** A metal washer
 - G A rubber band
 - H A wooden spoon
 - J A piece of paper
3. Which of the following best describes what matter is?
- A Anything you can see or touch
 - B** Anything that has mass and takes up space
 - C Anything that can change into something else
 - D Anything that will stick to a strong magnet

Physical Properties of Matter

Name: KEY

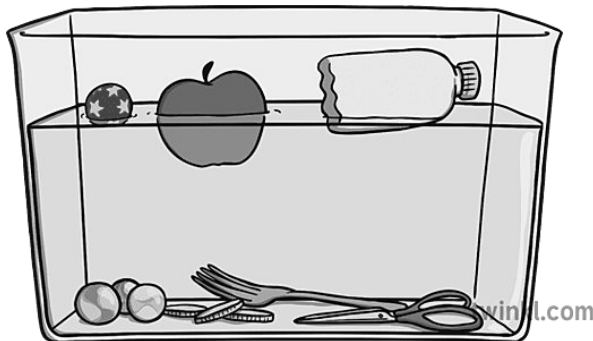
Evaluation

4. A student put a ball on each side of a balance and observed what happened. Which of the following is the most likely conclusion the student made from observing the balance?



- F** Ball 1 and Ball 2 are the same size.
- G** Ball 1 and Ball 2 have the same mass.
- H** Ball 2 weighs more than Ball 1.
- J** Ball 1 has more mass than Ball 2.

Use the illustration below to answer questions 5 and 6.



5. Which physical property of matter are students testing in the illustration?
- A** The temperature of the water
 - B** The magnetism of the washer
 - C** The ability of the block to sink or float
 - D** The amount of mass that each object has
6. Which of the following objects sink in the water? Choose **two** answers.
- F** The fork
 - G** The apple
 - H** The scissors
 - J** The empty water bottle
 - K** The ball with stars on it

Physical Properties of Matter

Name: _____

Physical Property: Temperature

Question

What makes the red liquid in a thermometer go up and down?

My Hypothesis

Temperature Data

| | |
|---------------------------|--|
| Beginning Temperature | |
| Temperature of Cold Water | |
| Temperature of Warm Water | |

My Observations: (Describe what happened to the red liquid in the thermometer when you moved it from the air to the cup of cold water to the cup of warm water.)

My Conclusions: (Was your hypothesis correct?)

Physical Properties of Matter

Name: _____

Physical Property: Mass

Question

How can I use scales to find the mass of an object?

Most Mass to Least Mass

Mass of Different Objects

| | Mass in pennies | Mass in grams |
|------------------------|-----------------|---------------|
| Pencil | | |
| Scissors | | |
| Notebook | | |
| Foam cup | | |
| Bottle of water | | |

My Observations:

Physical Properties of Matter

Name: _____

Physical Property: Magnetism

Question

How can I test objects to see if they are magnetic or nonmagnetic?

Magnetic or Nonmagnetic?

| Object | Prediction | Result |
|--------|------------|--------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

My Conclusions:

Physical Properties of Matter

Name: _____

Physical Property: Sink or Float

Question

How can I test objects to see if they sink or float in water?

Sink or Float?

| Object | Prediction | Result |
|-------------|------------|--------|
| Craft stick | | |
| Eraser | | |
| Grape | | |
| Paper clip | | |
| Pecan | | |
| Pencil | | |
| Penny | | |
| Walnut | | |

My Conclusions:

Physical Properties of Matter

Name: _____

Elaboration

Question

How can changing the shape of matter affect its ability to sink or float?

1. What is the mass of your ball of clay?
Before | After
2. What happened when you first dropped the ball of clay in the water?

Test 1:

Shape:

Sink or float?

Test 2:

Shape:

Sink or float?

Test 3:

Shape:

Sink or float?

Test 4:

Shape:

Sink or float?

My Conclusions:

Physical Properties of Matter

Name: _____

Evaluation



Describe the physical characteristics of the apple in the space below.

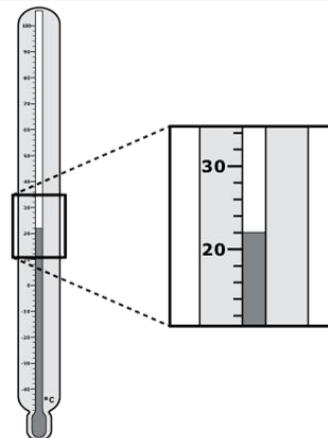
Physical Properties of Matter

Name: _____

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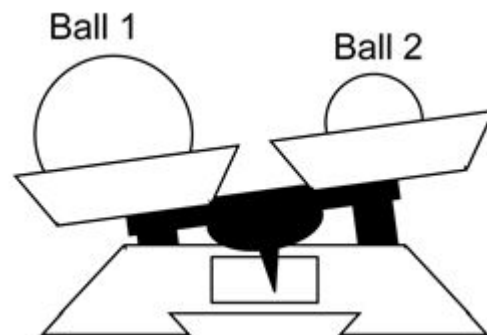
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Physical Properties of Matter

Name: _____

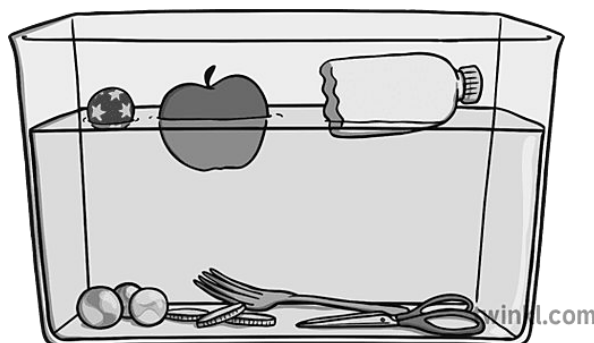
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