

Chemistry All Around Us!

Week 5: Grades 6-8

Day	Topics	Related Standards
1	Properties of Matter	Obtain and evaluate information regarding how scientists identify substances based on unique physical and chemical properties.
2	Density	
3	Elements vs. Compounds	Develop and use models to represent that matter is made up of smaller particles called atoms
4	Photosynthesis	Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved.
5	Molecule Basics	

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Day 1: Properties of Matter

Teacher/Parent Background:

Matter is anything that has mass and takes up space. Matter is what forms all of the physical things around us, from the tiniest atom to the largest galaxy and from the water we drink to the air we breathe. Matter can be measured, tested, and observed by its physical properties, which are the appearances of an object, including mass, magnetism, physical state, relative density, solubility, and the ability to insulate or conduct heat or electricity.

Overview:

In this activity, students measure, test, and observe items to examine the physical properties of matter.

Related Standards:

Obtain and evaluate information regarding how scientists identify substances based on unique physical and chemical properties.

Key Terms:

- Matter: Anything that takes up space and has mass.
- Physical Properties: Measurable characteristics that describe the physical state of something, including mass, magnetism, temperature, density, shape, volume and conductivity.
- Magnetism: The property or attraction to a magnet.
- Physical State: The classification of matter as solid, liquid or gas.
- Solubility: Measurement of the ability of a solid to dissolve in a liquid.
- Conductor: Material that allows heat or electrical energy to easily flow through it.
- Insulator: Material through which heat or electricity does not easily flow.

Materials List:

Part 1:

- Any combination of items such as. Feel free to substitute as necessary: Marshmallow, penny, ping pong ball, golf ball, bouncy ball, iron nail, paper clip, foil.

Part 2:

- 4 plastic cups
- 1 teaspoon of each:
 - Sugar, salt, cinnamon, sand

Activity Description:

1. Provide students with student resources and ask them to follow the instructions. Allow students to substitute items with similar items or to skip items if no substitute can be found.
2. If items need to be skipped you can use the answers below to help students fill in their tables.

Item	Magnetic?	State of Matter?	Sink or Float?	Conductor or Insulator?
Marshmallow	N	Solid	Float	Insulator
Penny	N	Solid	Sink	Conductor
Ping Pong Ball	N	Solid	Float	Insulator
Golf Ball	N	Solid	Sink	Insulator
Iron Nail	Y	Solid	Sink	Conductor
Paper Clip	Y	Solid	Sink	Conductor
Foil	N	Solid	Float	Conductor

Substance	Observation
Sand	It did not change when placed into the water. It sank and stayed intact.
Sugar	The sugar seemed to disappear when it was mixed into the water.
Salt	The salt also seemed to disappear when it was mixed in the water.
Cinnamon	The cinnamon seemed to dissolve when it was mixed into the water but you can still see pieces of it floating on top

Closure:

Discuss the following with students:

- **What types of objects are attracted to magnets?** Which types of materials are not attracted to magnets? Items that are attracted to magnets are items that have iron in them. Not all metals are magnetic. Metals that do not have iron in them are not magnetic.
- **Understanding the physical properties of matter is helpful because...** Knowing the properties of matter is helpful, because when people make things they need to know how those materials will react when placed in water or next to a magnet or if electricity will flow through them.

Extensions:

Properties Scavenger Hunt!- Students go on a scavenger hunt in their own homes. Give students a list of items to collect based on physical properties, for example, one item that is magnetic, one item that is a good heat insulator, etc. The students collect the items and post photos to google classroom with a short description.

Student Resources

PART 1: You will be testing a variety of materials (*feel free to substitute materials or only fill out what you can find*) for their physical properties. Using the chart below list the materials and record the following physical properties for each:

- Is it magnetic?
 - Determine if the item is attracted to a magnet or not.
- State of matter (solid, liquid, gas)
- Ability to sink or float
- Conductor or insulator

Item	Magnetic?	State of Matter?	Sink or Float?	Conductor or Insulator?
Marshmallow				Insulator
Penny				Conductor
Ping Pong Ball				Insulator
Golf Ball				Insulator
Iron Nail				Conductor
Paper Clip				Conductor
Foil				Conductor

PART 2: You will need 4 plastic cups, each filled halfway with water and 1 teaspoon of each: *sand, sugar, salt and cinnamon*.

1. Put one substance in each cup of water and record how each substance reacted when you mixed it with water.

Substance	Observation
Sand	
Sugar	
Salt	
Cinnamon	

Part 3: Look at the information in the chart below and answer the following question:

1. Boiling water was placed in the container made of the four different materials. Based on the data, which material was the best conductor of heat?

Material	Water Temperature (° C)			
	0 min.	5 min.	10 min.	15 min.
1	100	87	85	81
2	100	96	93	91
3	100	78	71	63
4	100	92	87	83