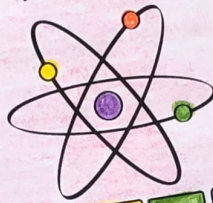


science

Flip book

UNDERSTANDING MATTER

ALL THAT MATTERS IS



MATTER

Student's Name _____

UNDERSTANDING MATTER

PHYSICAL PROPERTIES OF MATTER

STATES OF MATTER

THE EFFECTS OF HEATING & COOLING

CONSERVATION OF MATTER

MIXTURES & SOLUTIONS

PHYSICAL & CHEMICAL CHANGES

created by the owl teacher



TEACHER'S NOTES

Thank you so much for your purchase!

In this resource, you will find the topic of matter covered thoroughly. You can pick and choose pages to include or include all of them. The following subtopics are included:

- Understanding matter
- Physical properties of matter
- States of matter
- The effects of heating and cooling (changing states of matter)
- Conservation of matter
- Mixtures and solutions
- Physical and chemical changes

This resource is interactive, meaning that there are some questions students will need to complete as they progress through the flipbook. My goal was to make this resource stand-alone. This means that your students should not have to access a textbook or another resource to be able to understand or complete the questions in it. I have also included an answer key.

TO ASSEMBLE:

- 1.) Make copies of all the pages you intend for students to use.
- 2.) Have students complete the pages and color them (if desired).
- 3.) Have students cut below the labeled ribbon at the bottom of the page. The exception is the first page where there is no ribbon. Instead, they will cut along the line.
- 4.) Have students layer the flipbook pages on top of one another with the longest one being on the bottom.
- 5.) Have students place a dab of glue along the top portion that is grayed that states "glue here." (or staple along the top.)

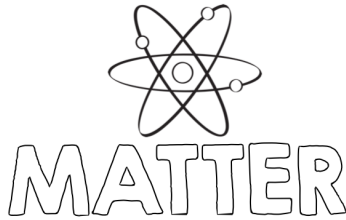
It is my hope that you find this resource helpful and engaging while learning about matter!

Mistakes do happen, so if you see anything that needs to be fixed or if you have any additional feedback, please let me know via the Q&A or by email at tammy@theowlteacher.com. I will take care of it immediately!

Thank you!



ALL THAT MATTERS IS



staple or glue here

All objects around you are made up of matter. What is matter? **Matter** is made up of tiny particles, called atoms, that are too small to see. It is anything that can take up space and has weight. Matter cannot take up the same space as another object.

List some objects below that are made up of matter:

In your own words, describe what matter is:

staple or glue here

There are many different types of objects and materials in the world. Even though they are all made of matter, they have different particles (or atoms) that have certain measurable characteristics. These characteristics, or **properties**, are like their fingerprint. No two substances, objects, or materials are exactly the same. They all have different properties.

For instance, sugar is a substance. Salt is also a substance. They both look very similar, they have very different properties. They do not have the same properties as all sugar throughout all of it.

Scientists use properties to help identify objects, materials, and substances. Properties such as color, size, shape, solubility, hardness, and conductivity.

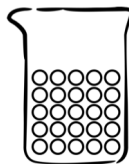
Pick an object from your desk. Observe the different properties. List them below. For instance, is your object dull or shiny? How does it feel? See if your neighbor can figure out your object based on your list.

PHYSICAL PROPERTIES OF MATTER

UNDERSTANDING MATTER

staple or glue here

The particles (or atoms) in matter are always moving, even when the object appears to be motionless. These particles do not always move the same way. The particles move based on its volume and shape.

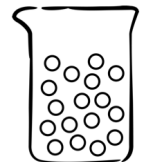


SOLID

In a solid state, it has a fixed volume and a fixed shape. The particles are close together and vibrate in place while attached to each other. An example of a solid state would be ice.

LIQUID

In a liquid state, it has a fixed volume but not a fixed shape. This means the amount of space it takes up can't change but the shape can. The particles are close together and able to move. They slide past one another like marbles in a bowl, but still staying near each other. An example would be water.



GAS

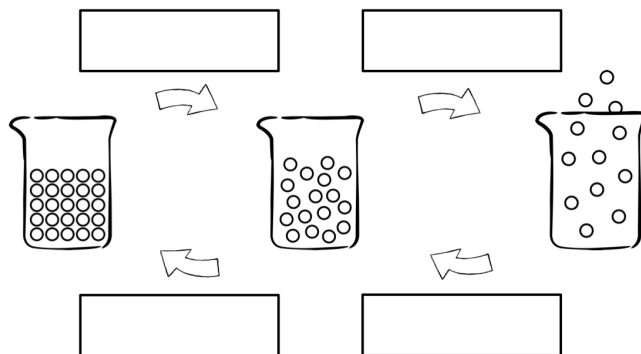
In a gas state, the particles are always moving because they have a fixed volume or shape. The amount of space they take up or the shape of the gas can change. The particles spread out and move freely in all directions. They don't stay close to each other. An example would be water vapor.

staple or glue here

Substances can change from one state of matter to another by adding heat or removing it (cooling). This can be done through these 4 common state changes:

- 1.) Melting - solid to a liquid (the particles break away from each other)
- 2.) Freezing - liquid to a solid (the particles slow down and stick together)
- 3.) Evaporation - liquid to gas (particles move faster and apart)
- 4.) Condensation - gas to liquid (cools; slows down and stick together)

Using this information, complete the chart below.



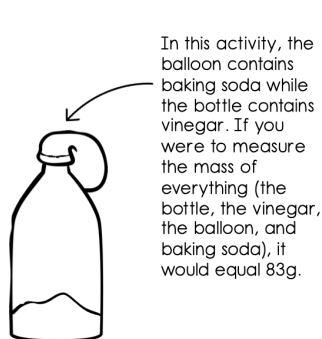
PHASES OF MATTER

THE EFFECTS OF HEATING & COOLING

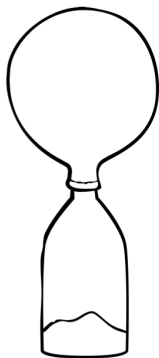
staple or glue here

During any change, matter is conserved - or kept at the same amount. The total amount of matter stays the same during any change.

You can check that matter is conserved by measuring the weight of matter of a substance before and after a change. Matter is never created nor destroyed. Instead particles may rearrange, join together, or break apart.



In this activity, the balloon contains baking soda while the bottle contains vinegar. If you were to measure the mass of everything (the bottle, the vinegar, the balloon, and baking soda), it would equal 83g.



In this image, the baking soda was poured out of the balloon and into the vinegar of the bottle. When they mixed, they reacted to create a gas. The balloon's weight was included in the total weight.

staple or glue here

A mixture is a combination of 2 or more substances whose particles are not joined together. This means that the mixture can be separated again into their original pure substances.

Mixtures can be separated by hand, evaporation, condensation, or other methods.

Mixtures can be any state of matter. For instance, steel is a mixture of two solids (carbon and iron). The rock pumice is a mixture of a gas and a solid (air and pumice). Fog is a mixture of liquid and a gas (air and water).

All mixtures are physical changes.

Sometimes mixtures mix completely with another material and it appears to be one material. This means it has dissolved and created a solution. A solution is a mixture when particles of one material is dissolved with particles of a different material. Each drop of the solution is the same as other parts of the solution. An example of this is sugar water. The sugar is not gone. If you were to boil the water, the sugar crystals would be left behind.

Not all mixtures are solutions but all solutions are mixtures.

In your own words, what does conservation of matter mean?

CONSERVATION OF MATTER

staple or glue here

Matter can change. Some changes can be reversed, or undone, while others cannot. The two types of changes are physical changes and chemical changes.

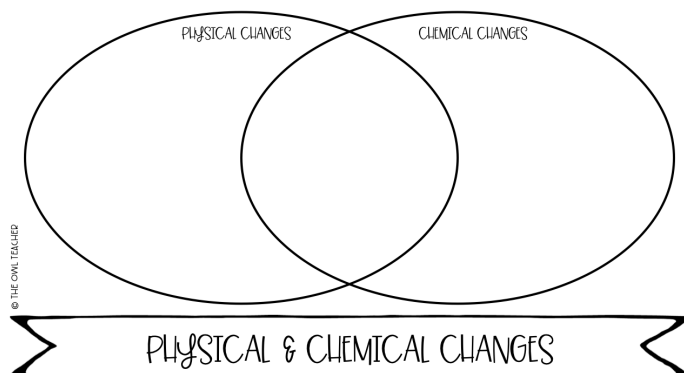
During a physical change, no new substances are formed. Substances can change in shape or appearance, such as being folded, cut, or even bent. A substance can be mixed with another substance or dissolved. It can even change states.

Chemical changes are the opposite. When a chemical change occurs, a new substance is made. This typically occurs because two or more materials rearrange, join together, or separate and a new substance is formed. The new substance that is formed has different properties than the original substance.

It isn't always easy to tell if a chemical change has occurred, so scientists often look for a combination of signs. Some signs that can help you determine if a chemical change took place is gas formation, solid formation, color change, and energy change (light, heat, or sound).

Some examples of a physical change would be tearing paper, cutting a banana, a melting ice cube, shredding cheese, salt water, and mixing butter with sugar. Examples of chemical changes include rusting, baking a cake, frying an egg, a rotting apple, a burning log, and mixing vinegar with baking soda.

Compare and contrast physical and chemical changes.



word bank below, determine if they are a mixture or a solution. Under the correct heading.

; kool-aid; bowl of cereal; trail mix; salad; sugar water; sand and pepper; rubbing alcohol; soda;

MIXTURE

SOLUTION

MIXTURES & SOLUTIONS

PLUS
ANSWER
KEYS!