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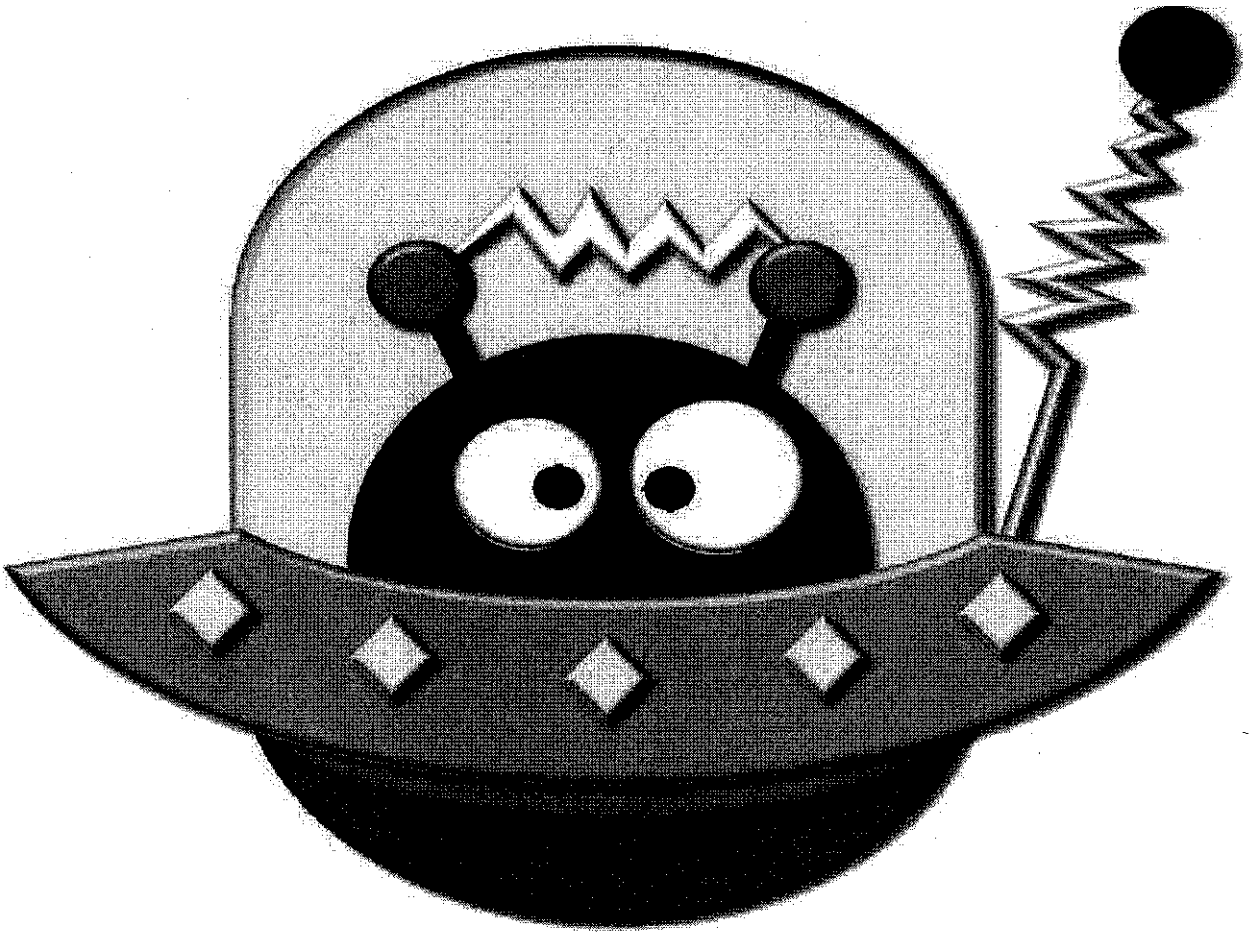
5th Grade Science



To Proficiency and Beyond!

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5th grade Daily Science Assignments:

Day 1 Read matter student guide and answer questions 15-18 on Matter Questions sheet. For the following vocabulary words, define, draw a picture , and use in a sentence: Atom , Element, Molecule

Day 2 Work P55A Independent Practice Sheets (2 pages)

Day 3 Work P55A Atom and Molecules Sheet

Day 4 Make flash cards for the following vocabulary words and play one of the vocabulary games listed on Vocabulary Sheet: matter, atoms, molecules, proton, neutron, electron compound, heterogeneous, homogeneous, solution, mixture, solute, and solvent, physical change, chemical change

Day 5 Use Matter Student Guide to answer questions 1—14 on the Matter Questions Sheet

Day 6 Read and answer questions from Mixture Reading passage

Day 7 Work P.5.5.B Independent Practice Sheets

Day 8 Use Matter Student Guide to answer questions on the Matter Questions Sheet 19-23 and read and answer questions for States of Matter Reading Passage

Day 9 Read and answer questions from Physical and Chemical Properties Reading Passage

Day 10 Work P.5.5.C Independent Practice Sheets

Vocabulary Games and Directions:

Game 1: Card Sort for Individual or Group Review:

1. Separate the vocabulary cards and definition cards into two stacks.
2. Mix / shuffle the cards in each stack.
3. This is a mix/match game. Your goal is to correctly pair each vocabulary card with the correct definiton card.
4. If instructed, record each term and definition on the provided recording sheet or a piece of notebook paper

Game 2: Catch Phrase Style

1. Place the vocabulary cards facedown in a stack.
2. One student draws a card, looks at the word, but does not allow the other students in the group to see the card. The student drawing the card is the "clue---giver." This student must describe the word, define the word, make gestures about the word, or give any sort of verbal clues in an attempt to get the other members of the group to guess the word. The clue---giver cannot use the word in the descrip7on, nor give out hints, such as the first letter of the word.
3. Award the student guessing the word a point. The student responding with the correct word becomes the clue---giver in the next round. Continue playing until all vocabulary words have been reviewed.

Game 3: Concentration

1. Spread out the vocabulary cards (facedown) on one side of the table. Spread out the corresponding definiton cards (facedown) on the other side of the table. Cards should be placed in straight rows and columns.
2. Begin game play by having one student turn over a vocabulary card and a definition card. If there is no match, both cards are turned facedown in the same posi7on and play passes to the next student.
3. If the cards match (the correct definition card with the vocabulary card), the student keeps the matching cards, and is allowed to try to make another match. You must "concentrate" to remember where you have seen a particular vocabulary or defini7on card. Continue play until all cards are matched. The winner is the student who made the most matches.

Game 4: Pictionary Style

Shuffle the vocabulary cards and place them facedown on the table.
One student begins the game by drawing a vocabulary card from the deck. This student attempts to draw a picture or diagram of the vocabulary word. Other students in the group will a**tt**empt to guess the vocabulary word.
Game play then passes to another student in the group.

Game 5: Let's Talk About It!

You will be paired with a single partner.
Mix up the vocabulary cards and place them facedown.
Draw 10 cards from the stack.
When the teacher starts the game, you and your partner must have a conversation in which you use (correctly!) as many of the vocabulary words in your stack as possible.
The conversation cannot consist of you reciting definitions to one another!
As you use a word, the card should be removed from your hand and placed on the table. The game ends when you or your partner have used all 10 words on your vocabulary cards

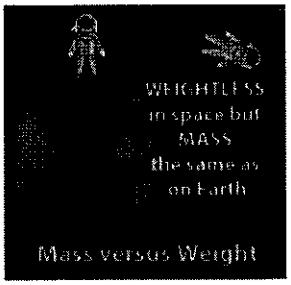
SOL 5.4 – MATTER

SOL 5.4 - Matter is anything that has mass and takes up space; and occurs as a solid, liquid, or gas.

Key concepts:

a. properties of each phase of matter;
b. the effect of temperature on the phases of matter;
c. atoms and elements;
d. molecules and compounds;
e. mixtures including solutions

WHAT IS MATTER?

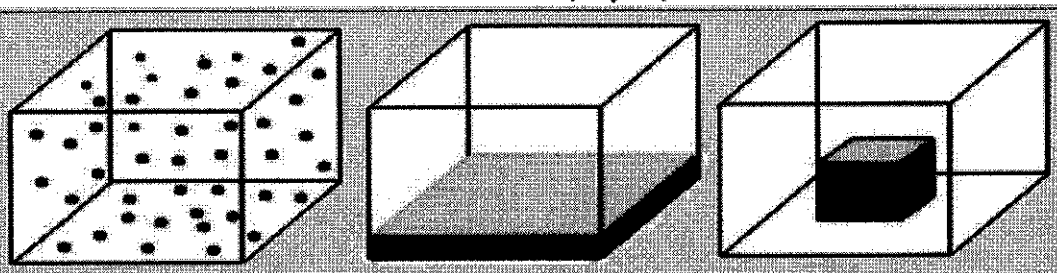


- **Matter** is anything that has **mass** and **volume.**
- **Mass** is the amount of matter in an object. The mass of an object does not change. (**Weight** of an object changes based on the **gravitational pull** on it. A person will have the same mass on Earth, Mars, and our moon. However, his or her weight on our moon will be 1/6 of what it is on Earth and will be 1/3 as much on Mars.)

PHASES OF MATTER : SOLID, LIQUID, GAS

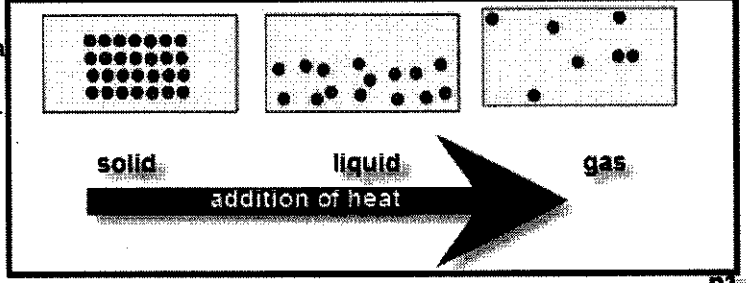
- Matter can exist in several distinct forms which are called **phases.** The three basic phases of matter generally found on Earth are **gas, liquid,** and **solid.** (Though other phases of matter have been identified, these are the phases of matter that fifth-grade students are expected to know.)

Characteristics of Gases, Liquids, and Solids



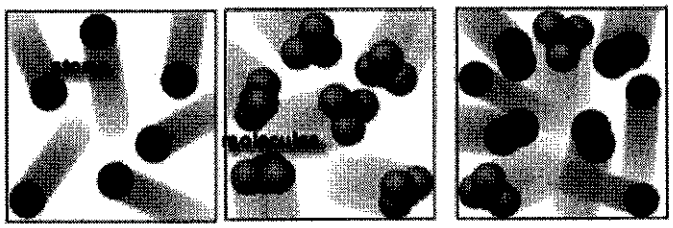
GAS	LIQUID	SOLID
Assumes the **shape of its container**	Assumes the **shape of its container**	Retains a **fixed shape**
Assumes the volume of its container – **no definite volume**	Has a **definite volume**	Has a **definite volume**
Compressible (lots of free space between particles)	**Not easily compressible** (little free space between particles)	**Not easily compressible** (little free space between particles)
Flows easily (particles can move past one another)	**Flows easily** (particles can move/slide past one another)	**Does not flow easily** (rigid-particles cannot move/slide past one another)

- As its temperature increases, many kinds of matter change from a solid to a liquid to a gas. As its temperature decreases, that matter changes from a gas to a liquid to a solid.



ATOMS, MOLECULES, ELEMENTS

- All matter, regardless of its size, shape, or color, is made of particles (atoms and molecules) that are too small to be seen by the unaided eye.
  - There are more than 100 known elements that make up all matter.
  - A few of the more familiar elements include: hydrogen (H), oxygen (O), helium (He), carbon (C), sodium (Na), and potassium (K).
  - The smallest part of an element is an atom.



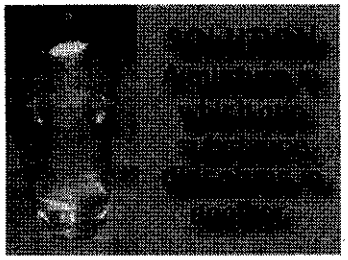
ELEMENT
examples:
oxygen (O)
hydrogen (H)
helium (He)
carbon (C)
potassium (K)
sodium (Na)

COMPOUND
examples:
table salt (NaCl)
water (H_2O)

MIXTURE
examples:
air
milk
salad dressing

MIXTURES & COMPOUNDS

- When two or more elements combine to form a new substance, it is called a compound.
  - There are many different types of compounds because atoms of elements combine in many different ways (and in different whole number ratios) to form different compounds.
  - Examples include water (H2O) and table salt (NaCl). The smallest part of a compound is a molecule.



- A mixture is a combination of two or more substances that do not lose their identifying characteristics when combined. A solution is a mixture in which one substance dissolves in another.

NANOTECHNOLOGY

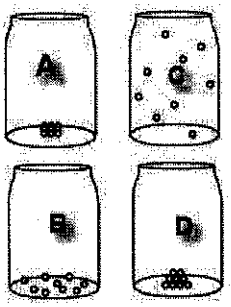
- Nanotechnology is the study of materials at the molecular (atomic) scale. Items at this scale are so small they are no longer visible with the naked eye. Nanotechnology has shown that the behavior and properties of some substances at the nanoscale (a nanometer is one-billionth of a meter) contradict how they behave and what their properties are at the visible scale. Many products on the market today are already benefiting from nanotechnology such as sunscreens, scratch-resistant coatings, and medical procedures.

MATTER QUESTIONS

Matter is anything that has mass and takes up space; and occurs as a solid, liquid, or gas. Key concepts:

- **a. properties of each phase of matter;**
- **b. the effect of temperature on the phases of matter;**
- **c. atoms and elements;**
- **d. molecules and compounds;**
- **e. mixtures including solutions**

SOLID-LIQUID-GAS – PHASES OF MATTER



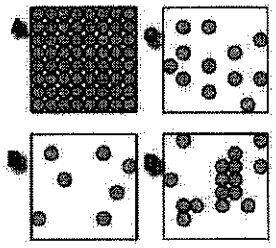
1. The circles in the bottles represent the same particles of matter. Which pattern of particles represents a gas in a bottle?
(2005-28)

2. What will happen if the lid is removed from a container that holds helium gas?
(2004-12)
   a. The gas will expand and escape from the container.
   b. The gas will slowly change back into a liquid.
   c. When light hits the gas, it will change colors.
   d. Gravity will keep the gas in the container.

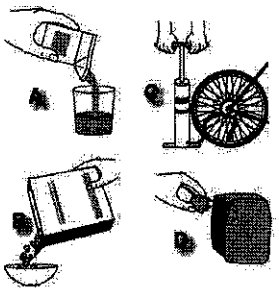
3. Oxygen, nitrogen, and carbon dioxide may be grouped together because at room temperature they are all a —
(2001-7)
   a. solid
   b. liquid
   c. gas
   d. colloid

4. Which of these will happen if the temperature of a metal pan is increased?
(2001-13)
   a. The pan will begin to lose heat.
   b. The molecules of the pan will move faster.
   c. The metal will change into another metal.
   d. The pan will contract.

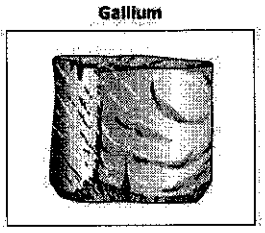
5. Which of the diagrams best shows the arrangement of molecules in a solid?
(2006-34)



6. Which picture shows a liquid at room temperature?
(2005-4)



7. Gallium is a metal that melts at about 30°C. If a person, whose body temperature is 37°C, held a cube of gallium for five minutes, what will most likely happen to the gallium?
(2011-18)
   a. It will change to a gas.
   b. It will change to a liquid.
   c. It will become a solution.
   d. It will become a mixture.

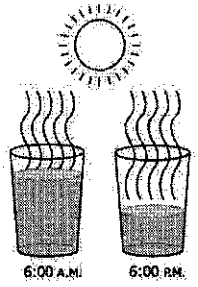


8. When ice cream is left out of a freezer, the ice cream

9. changes from a —
(2009-4)
   a. solid to a gas
   b. gas to a liquid
   c. solid to a liquid
   d. liquid to a gas

10. Which of these shows how frozen water changes as the temperature of the air increases?
(2007-17)
   a. Gas → liquid → solid
   b. Solid → gas → liquid
   c. Liquid → gas → solid
   d. Solid → liquid → gas

11. The process shown would be classified as —
(2010-12)
   a. precipitation
   b. condensation
   c. transpiration
   d. evaporation



13. Which of these will change solid iron to a liquid?
(2006-15)

a. Raising the air pressure

b. Increasing its temperature

c. Crushing the solid iron

d. Adding water to the iron

14. Which of the following changes is possible with the addition of heat?
(2003-3)

a. Liquid water changes to ice.

b. Water vapor changes to ice.

c. Water vapor changes to liquid water.

d. Ice changes to liquid water.

ATOMS, ELEMENTS, MOLECULES, COMPOUNDS

15. Water, ice, and steam are alike because they —
(2006-28)

a. are the same compound

b. have the same shape

c. look the same

d. feel the same

16. The smallest quantity of an element is —
(2002-10)

a. a compound

b. an atom

c. a solution

d. a molecule

17. The smallest part of matter that is identifiable as an element is the —
(2003-36)

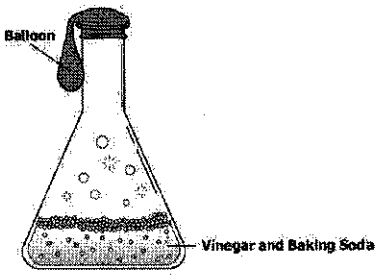
a. atom

b. molecule

c. cell

d. compound

18. Which of these will most likely happen to the balloon as the chemicals react?
(2011-6)



a. It will float.

b. It will break.

c. It will inflate.

d. It will change color.

MIXTURES & SOLUTIONS

19. Which of these is a mixture?
(2006-13)

a. Salt

b. Water

c. Lemonade

d. Sugar

20. People put sugar in their tea to make it sweet. The sugar will dissolve fastest when the tea —
(2004-16)

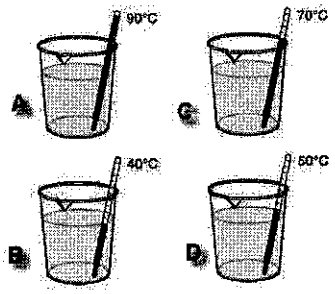
a. is hot

b. is cold

c. is in a tall glass

d. has lemon in it

21. In which beaker of water will sugar dissolve the fastest?
(2005-35)



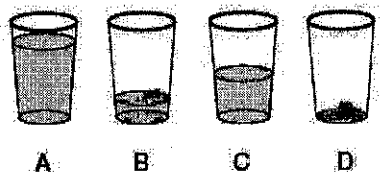
22. A student makes a fruit drink by stirring a powdered mix into cold water. Why is the fruit drink a solution?
(2009-18)

a. The powder dissolves in the water.

b. The water changes color.

c. The student stirs the water.

d. The water is the proper temperature.



23. Which set of pictures shows what happens to a glass of salt water when it is left out on a counter for several weeks?
(2006-31)

a. C→D→A→B

b. A→C→B→D c.

B → A → C → D d.

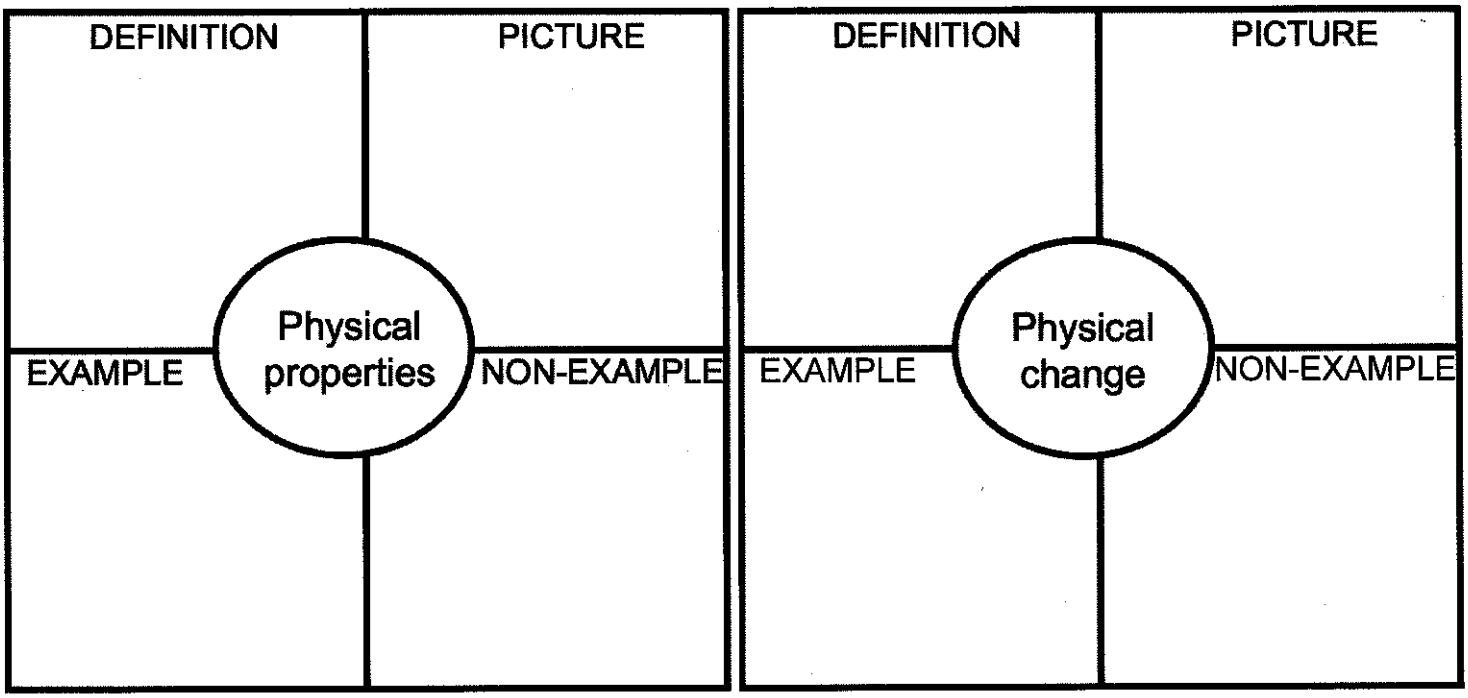
D → B → A → C

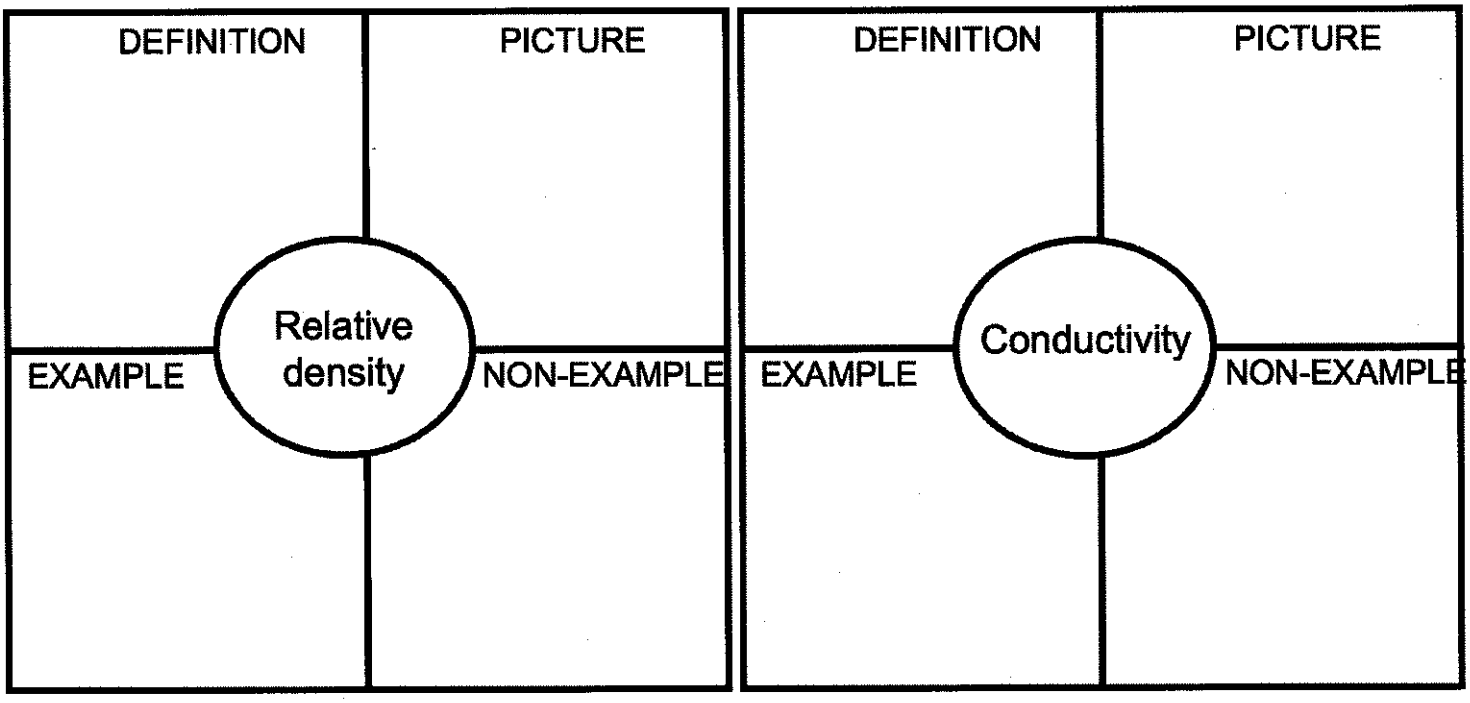
Independent Practice

Name: _____ Date: _____

Part I: Four Square

Directions: Fill in the four sections of the model to describe the vocabulary word or phrase.





Independent Practice

Part II: Word Path Find

Directions: Read the clue and find the correct word in the box by coloring the path. The first letter is shaded.

S	E	S	T
S	N	D	A
D	H	R	A
A	T	L	H

1. The ease of scratching a smooth surface of an element

V	I	T	I
I	C	C	U
T	O	U	D
Y	N	D	Y

2. The transmission of light, heat, sound, or electricity by a substance

T	F	E	O
E	L	R	I
C	O	N	N
T	I	R	F

3. Energy bouncing off of a surface

B	Y	T	I
O	S	O	L
L	U	L	I
Y	I	U	B

4. A solid that is able to dissolve in a liquid

S8P1a. Atoms & Molecules

Name: _____

Essential Question: How are atoms and molecules related?

Part I

Atoms:

_____

_____

Elements:

_____

_____

Molecules:

_____

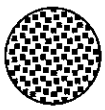
_____

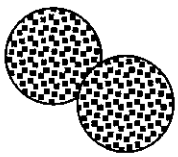
_____

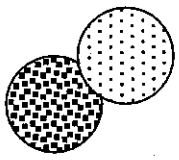
_____

Part II

Identify whether the following is an atom, element, or molecule. Explain your answer.







_____ _____ _____

Draw and label your own atom, element, and molecule.

S8P1a. Atoms & Molecules

Name: _____

Part III

Identify the number of atoms in each of the following molecules. Use a periodic table if needed to identify element symbols.

3. H_2O _____

4. NaCl _____

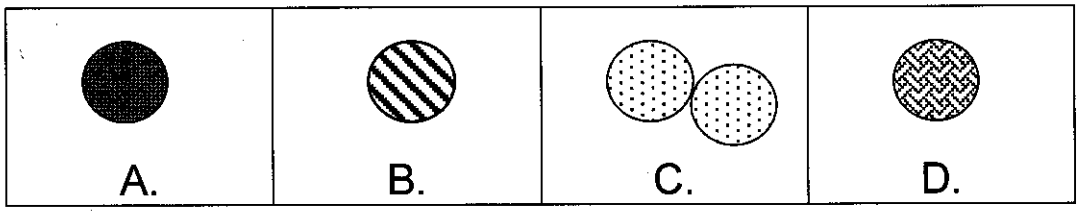
5. CO_2 _____

6. NH_3 _____

Part IV Summarizing Strategy

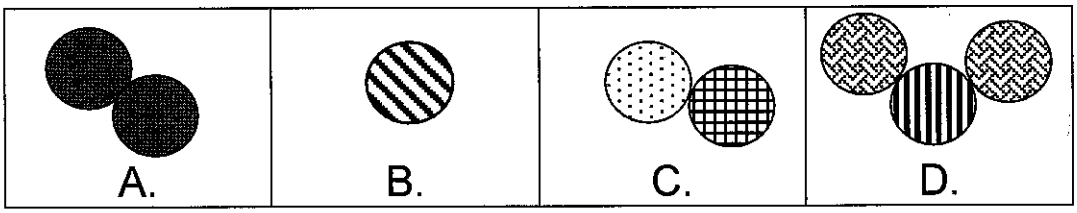
Quad Clusters: Which one does not belong? Explain your answer.

1.



_____

2.



_____

Independent Practice

Name: _____ Date: _____

Part I: Word Find

Directions: Using the clues below, find the hidden vocabulary words and phrases.

E	F	E	F	H	N	X	E	F	S	U	E
J	V	F	V	R	M	A	K	U	D	R	P
Q	V	A	H	L	V	C	B	J	U	C	P
C	L	C	P	M	O	S	V	T	V	I	R
M	L	Y	R	O	T	S	X	K	N	T	O
H	I	U	L	A	R	I	S	R	W	E	P
C	Y	Z	N	T	M	A	M	I	A	N	E
J	E	C	W	E	G	P	T	L	D	G	R
E	E	L	N	H	X	K	K	I	O	A	T
N	O	I	T	U	L	O	S	N	O	M	I
U	C	F	I	L	T	E	R	S	J	N	E
S	H	E	N	Q	W	U	Z	M	V	T	S

1. Something made of all one material
2. When one substance mixes evenly in another substance
3. Two or more substances that do not mix evenly
4. To spread out evenly in a substance
5. Characteristics of matter used to describe
6. A material with tiny holes; used to sort matter of different sizes
7. A state change from liquid to gas
8. Ability to attract to a magnet

Independent Practice

Part II: Word Scramble

Directions: Use the clues in parentheses to help you unscramble the words. Write the unscrambled word or phrase in the space provided.

1. A type of matter with specific properties

   (sscetbanus) S _ _ _ _ _ _ _ _ _

2. Physical or chemical characteristics

   (rptsoreiep) P _ _ _ _ _ _ _ _ _

3. Changing from a liquid to a gas

   (taoonaepvri) E _ _ _ _ _ _ _ _ _ _

4. Allow liquid or small grains to pass through

   (teslrfi) F _ _ _ _ _ _

5. Two or more substances

   (tiemxru) M _ _ _ _ _ _

6. Mixed evenly throughout another substance

   (utooslin) S _ _ _ _ _ _ _

Changes: Physical or Chemical?

By Cindy Grigg

[1] If you have studied atoms, you know that atoms are the building blocks of matter. Atoms are so small they cannot be seen with an ordinary microscope. Yet atoms make up everything in the universe. Atoms can combine with different atoms and make new substances. Substances can also break apart into separate atoms. These changes are called chemical changes or reactions. Chemical reactions happen when atoms gain, lose, or share electrons. What about when water freezes into ice? Do you think that's a chemical change?

[2] When water freezes, it has changed states. You probably already know about the four states of matter. They are solid, liquid, gas, and plasma. Plasma is the fourth state of matter and is the most common state in the universe. However, it is rarely found on Earth. Plasma occurs as ball lightning and in stars. Water is a common substance that everyone has seen in its three states of matter. Water in its solid state is called ice. Water in the liquid state is just called water. Water as a gas is called water vapor. We can easily cause water to change states by changing its temperature. Water will freeze at 32 degrees Fahrenheit (0° Celsius). However, no chemical change has occurred. The atoms have not combined or broken apart to make a different substance; it is still water or H2O. When we heat water to a temperature of 212° F. or 100° Celsius, it will change into a gas called water vapor. Changes in states of matter are just physical changes.

[3] Some more examples of physical changes are tearing paper into smaller pieces, sharpening your pencil, and stirring sugar into water. When you tear a piece of paper, it is still paper; it's just that the pieces are smaller. That is a physical change; a change you can easily see. When you sharpen your pencil, you have only caused a physical change. The sharpener has cut off some of the wood and maybe also some of the graphite, but the atoms of the wood and graphite have not changed chemically. You might think that the shavings you find inside the pencil sharpener are a new substance, but chemically they are not. They are still wood and graphite in smaller pieces than the original. When you stir sugar into water, you have only caused a physical change. The glass still contains water and sugar, but they have been mixed together. Is the sugar still there? Yes, you can taste it. This is only a physical change.

[4] Chemical changes are different because they cause a new substance to be formed, and they also either release energy or absorb it. Burning is a good example of a chemical change. When we burn wood, it releases energy in the form of heat and creates new substances: smoke and ash. Some signs of a chemical change are: smoking, change in color, change in temperature, bubbling, and fizzing. Have you ever mixed vinegar and baking soda together? If you have, you know that it bubbles! This is an example of a

chemical change. The new substance that is formed is carbon dioxide gas which causes the bubbles. When iron rusts, that is a chemical change. The iron changes to an orangey-red color, a sure sign that a chemical change has happened. The iron reacts chemically with the oxygen in the air. The new substance that is produced is rust. Chemical changes cannot easily be undone. When wood is burned, you cannot take the smoke and ash and change it back into wood. With physical changes however, you can "undo" the change. Water can be frozen into ice; the ice can be heated until it changes back into water and heated more until it changes into water vapor. Water vapor can condense and become water again, as it does in the clouds when it rains.

5 Physical changes account for our weather. The water cycle is water changing physically from one state to another, and it gives us rain, snow, sleet, and hail. Chemical changes are important to people, too, because chemical changes take place when we cook and eat our food. Chemical changes are used to produce the energy we need for heating our homes, running our electrical appliances, and driving our cars. Even breathing is a chemical reaction! Perhaps the most important chemical reaction of all is photosynthesis. Plants are able to produce their own food from the energy of the sun by a set of chemical reactions called photosynthesis. Without that, there would be no food for people. The process of photosynthesis also gives people oxygen to breathe. People depend on physical and chemical changes to live.

Name _____ Date _____

Changes: Physical or Chemical?

1. When do chemical reactions happen? (A) When matter changes states (B) When water boils (C) When water freezes into ice (D) When atoms gain, lose, or share electrons	2. How many states of matter are there? (A) Two (B) Four (C) One (D) Three
3. Matter in the plasma state is the most common in the universe. (A) False (B) True	4. Matter in the plasma state is the most common on Earth. (A) False (B) True
5. Changes in states of matter are _____. (A) Chemical changes (B) Neither (C) Physical changes	6. Why are chemical changes different from physical changes? (A) A new substance is formed. (B) They cannot be easily undone. (C) They release energy or absorb it. (D) All of the above
7. Which one of these is **not** a sign of a chemical change? (A) Smoking (B) Change in color (C) Change in shape (D) Bubbling	8. According to the passage, what is the most important chemical reaction of all? (A) Photosynthesis (B) Burning fuel (C) Respiration (D) Eating

Name _____ Date _____

Changes: Physical or Chemical?

Make a list of physical and chemical reactions named in the passage. See how many more you can think of, and list them as well.

Name _____ Date _____

Changes: Physical or Chemical?

Describe what a chemical reaction is.

Name _____ Date _____

Changes: Physical or Chemical?

Describe what a physical reaction is.

Changes: Physical or Chemical? - Answer Key

1 (D) When atoms gain, lose, or share electrons
2 (B) Four
3 (B) True
4 (A) False
5 (C) Physical changes
6 (D) All of the above
7 (C) Change in shape
8 (A) Photosynthesis

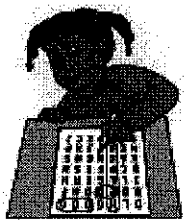
Changes: Physical or Chemical?

Reading Comprehension

Reading comprehension

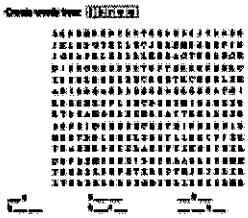
Puzzles using Word List

Word Search



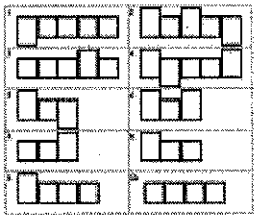
Word Search (PDF and options)

Make Words



Word building activity
Word building activity (with word search)

Word Shapes



Word Shapes (easier - one letter filled in)
Word Shapes (fill in word shapes and also write the word)
Word Shapes

Independent Practice

Name: _____ Date: _____

Part I: Word Sort

Directions: Write each word or phrase under the correct category in the chart.

Word Bank

Production of precipitate	Mass	Production of gas
Color change	Size	Magnetic
Production of heat or light	Rust	Solubility
Temperature change	Color	Relative density
Hardness	Weight	Insulate heat

Physical Change	Chemical Change

Independent Practice

Part II: Word Scramble

Directions: Use the clues to help you unscramble the words. Write the unscrambled word or phrase in the space provided.

1. A new substance formed with different properties

   ___e_____ __h____

2. Usually seen as bubbles

   _____c_____ ___ ____

3. Heating and cooling, changing shape, melting and freezing

   ___s_____ __h____

4. An increase or decrease in heat energy

   __e_____r__ __h____

5. Creation of a solid

   _____c_____ ___ ____c_____e