

**MATTER Study Guide**  
**DO NOT THROW AWAY!!!**


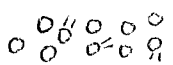
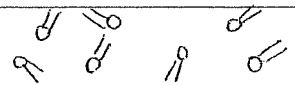
Name Answer Key  
 Period        7<sup>TH</sup> GRADE SCIENCE

*\*Do not forget to study your Scientific Method Study Guide!\**

Define or describe, with as much detail as possible, the following terms.

Matter	anything that has mass and volume; made of atoms
Physical change	matter change that does not change identity (size, shape, dissolving, state → nothing new)
Chemical change	matter change where a new substance is formed
Open system	matter and energy flow freely - no boundary - can escape
Closed system	matter and energy cannot escape - boundary / sealed
Atom	tiny particle that makes up matter - always in motion

Describe the behavior of atoms in all states of matter.

State of Matter	Motion of Atoms	Picture
Solid	locked together, vibrate in place	
Liquid	move faster, slide around, attracted	
Gas	move fastest, separate entirely, fill container	

Answer the following in COMPLETE sentences. Make sure to answer all parts of the question.

1. In what ways are solids, liquids, and gases the same?

Solids, liquids, and gases are all the same in the following ways - they are all made of atoms that are constantly in motion and they all have mass and volume.

2. Give an example of a physical change and explain why it is a physical change.

One example of a physical change is chopping wood. Chopping wood is a physical change because nothing new is formed and the identity of the wood does not change - only its shape does.

3. Give an example of a chemical change and explain why it is a chemical change. What is the new substance?

One example of a chemical change is burning wood. Burning wood is a chemical change because fire changes the wood into smoke and ash - two new substances.

4. Give an example of an open system and explain why it is an open system.

One example of an open system is boiling water in an open pot. This is an example of an open system because there is no lid to trap the escaping steam.

5. Give an example of a closed system and explain why it is a closed system.

One example of a closed system is an unopened two-liter of pop. This is an example of a closed system because the container is sealed and no matter can escape.

6. State the LAW OF CONSERVATION OF MATTER. Describe a detailed example to support the law.

The Law of Conservation of Matter states that matter cannot be created or destroyed. Matter changes forms, but the total amount of matter stays constant. If I weighed the mass of fuel, oxygen, and logs (reactants) before a fire, the mass of ash, soot, and smoke (products) would be equal.

For each of the following examples, decide if the change is physical or chemical. Put (X) in the correct column. If the change is chemical, how do you know?

Change Description	Physical	Chemical	Why chemical?
Ex. action of yeast in bread		X	Gas bubbles...eww
1. bending a metal wire	X		
2. burning logs in a fireplace		X	new smoke & ash
3. leaves changing color		X	new color & texture
4. water boils at 100 C	X		
5. your body digesting food		X	new substance
6. crushing ice in a blender	X		
7. rusting of iron		X	new rust
8. fryin' a big ol' chicken leg ☺		X	new color & odor
9. slicing a block of cheese	X		
10. chopping a tree into firewood	X		


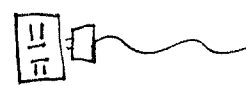
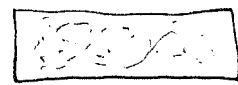
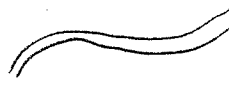
Decide if the following systems are open or closed. Put (X) in the correct column.

System Description	open	closed
A classroom lined with drafty windows...	X	
A test tube topped with a rubber stopper, lit match smoking inside...		X
A fancy Crock-Pot, latched up tight, can't smell the delicious chili...		X
An oven being used to bake cookies, the house smells wonderful...	X	
An unopened can of soda...		X

For each of the following examples, decide if the property is physical or chemical. Put (X) in the correct column.

Property	Physical	Chemical
1. flammability		X
2. density	X	
3. reactivity to acid or water		X
4. boiling point	X	
5. solubility	X	

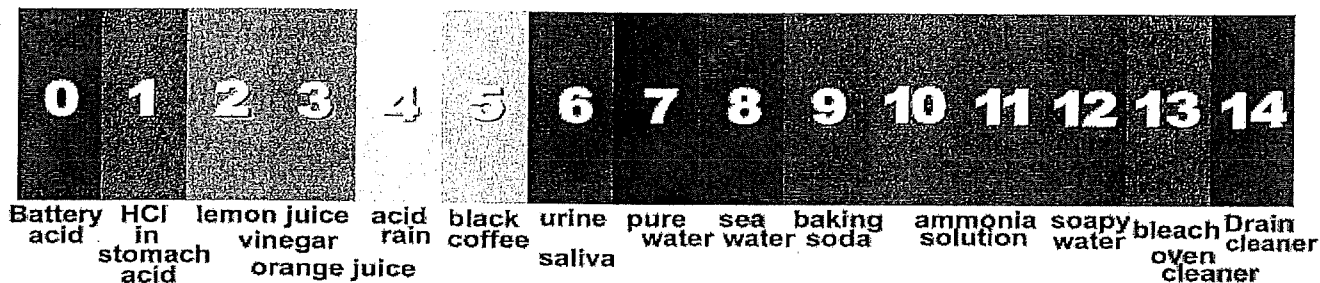
Describe each of the following properties and draw a quick sketch for each.

Property	Definition	Sketch
1. tendency to rust	when iron reacts with oxygen to produce iron oxide	
2. electrical conductivity	how well a substance allows electricity to flow through it	
3. malleability	The ability to be pressed or pounded into a thin sheet	 aluminum
4. ductility	the ability to be pulled into a thin strand, like a wire	 copper wire

Read each description. Write "A" for acid, "B" for base, or "N" for neutral.

- B 1. A solution with a pH of more than 7.
- A 2. The solution tastes sour.
- B 3. The solution changes red litmus paper blue.
- N 4. A solution with a pH of 7.
- B 5. The substance feels slippery and dissolves oils and fats.
- A 6. A solution with a pH of less than 7.

Use the pH scale below to answer the following questions.



1. What is the pH of soapy water? 12
2. What is the pH of black coffee? 5
3. What is the only neutral substance on the pH scale? pure water
4. What is the most acidic substance on this pH scale? battery acid
5. What is the most basic substance on this pH scale? drain cleaner

