

LESSON | What are the properties 16 | of nonmetals?

You know from your own experience what things are metals. You also have a good idea what things are not metals. What properties do all nonmetals have?

The properties of nonmetals are:

- Nonmetals are found in all states. Some are solids. Some are gases. And one nonmetal—bromine [BROH-meen]—is a liquid. All elements that are gases at room temperature are nonmetals.
- Nonmetals come in many colors. Bromine is a dark red liquid. Sulfur is yellow. Phosphorus [FAHS-fur-us] is white or red. Iodine is a steel-gray solid. Many gases have no color. They are invisible.

Some of the properties of nonmetals are exactly the opposite of the properties of metals.

- Nonmetals are poor conductors of heat and electricity. A substance that does not conduct heat and electricity is called an **insulator** [IN-suh-layt-ur].
- Nonmetals have no metallic luster.
- Nonmetals are not malleable. They break apart when they are hammered.
- Some nonmetals have odors. Chlorine is a greenish-yellow gas with a terrible odor. In fact, chlorine is poisonous.

We need nonmetals in our lives. The gases we breathe are nonmetals. Oxygen is the most important of these gases. Oxygen is a part of water, too. We cannot live without air and water.

WHAT DO THE PICTURES SHOW?

Look at each Figure. Then answer the questions.

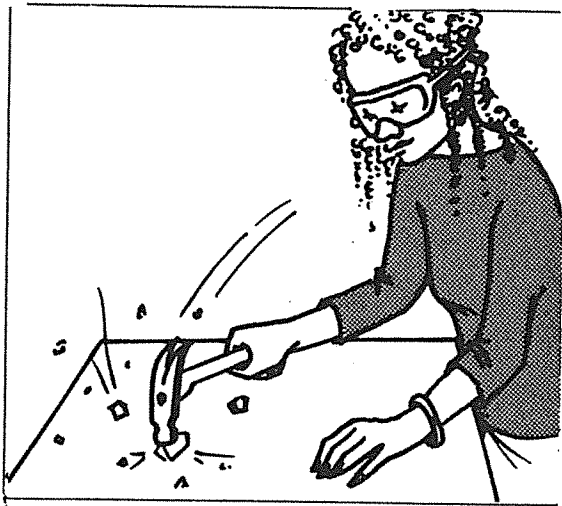


Figure A

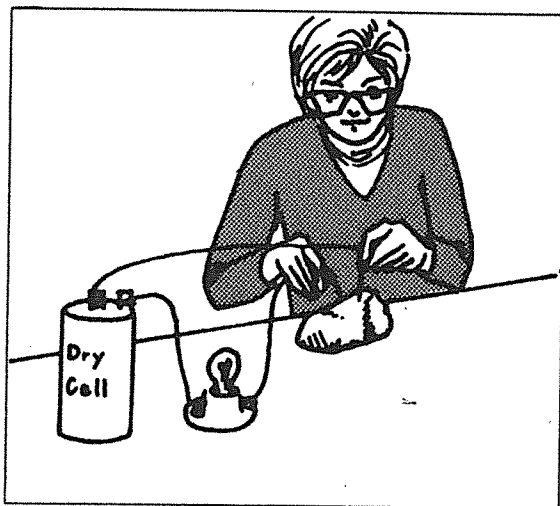


Figure B

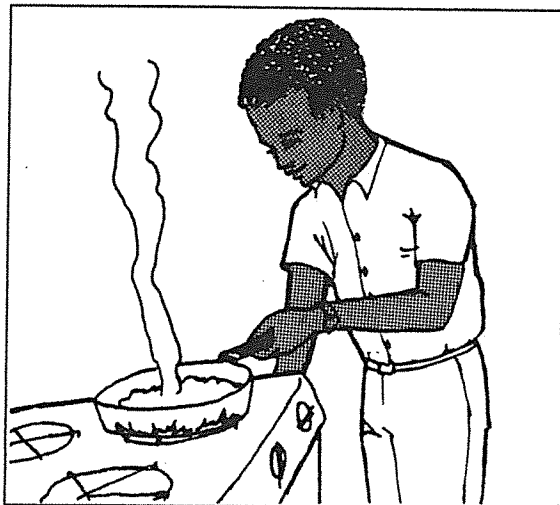


Figure C

1. A malleable solid _____ does, does not
break apart when it is hammered.
2. The solid in this picture
_____ is, is not malleable.
3. The solid in this picture probably is a
_____ metal, nonmetal
4. _____ are malleable.
Metals, Nonmetals
5. Sulfur is a _____ good, poor
conductor of electricity.
6. Sulfur is a _____ metal, nonmetal
7. Nonmetals are _____ good, poor
conductors of electricity.
8. Pots and pans are made of metals.
Metals are _____ good, poor
conductors of heat.
9. The handle of the pan in this picture is
covered with a _____ metal nonmetal
10. Nonmetals are _____ good, poor
conductors of heat.

MULTIPLE CHOICE

In the space provided, write the letter of the word that best completes each statement.

- _____ 1. All nonmetals are
a) matter. b) energy.
c) liquids. d) malleable.
- _____ 2. Matter that is a gas at room temperature must be a
a) conductor. b) metal.
c) nonmetal. d) insulator.
- _____ 3. Nonmetals are
a) good conductors of b) poor conductors of
heat and electricity. heat and electricity.
c) malleable. d) shiny.
- _____ 4. We know that sulfur is not malleable because sulfur is
a) matter. b) a metal.
c) a nonmetal. d) solid.
- _____ 5. An example of a poisonous gas is
a) oxygen. b) hydrogen.
c) bromine. d) chlorine.

TRUE OR FALSE

In the space provided, write "true" if the sentence is true. Write "false" if the sentence is false.

- _____ 1. Nonmetals are found in solid, liquid, and gas states.
- _____ 2. At room temperature, a metal can be invisible.
- _____ 3. Some nonmetals are invisible.
- _____ 4. Phosphorus is invisible.
- _____ 5. Nonmetals have a metallic luster.
- _____ 6. Nonmetals come in only a few colors.
- _____ 7. Metals are malleable.
- _____ 8. Nonmetals can be hammered. (*Careful, this is a trick question!*)
- _____ 9. Nonmetals are good conductors of electricity.
- _____ 10. Metals protect us from heat.

COMPLETE THE CHART

Complete the chart by filling in the missing information.

	Element	What is its state?	Is it a metal or nonmetal?	Does it have metallic luster?	Is it malleable?	Is it a good conductor of electricity?	Is it a good conductor of heat?
1.	aluminum						
2.	oxygen						
3.	phosphorus						
4.	iron						
5.	sulfur						
6.	chlorine						
7.	copper						

COMPLETE SENTENCES

Choose the correct word or term for each statement. Write your choice in the spaces provided.

- Gases are _____ .
metals, nonmetals
- This book is a _____ .
metal, nonmetal
- Metals are _____ conductors of electricity.
good, poor
- Nonmetals are _____ conductors of heat.
good, poor
- Metals _____ malleable.
are, are not
- _____ nonmetals are poisonous.
All, Some
- Chlorine is a _____ .
liquid, gas
- Chlorine is _____ .
dangerous, pleasant smelling
- _____ nonmetals have an odor.
Some, All
- Oxygen is a nonmetal because it is _____ .
a gas, needed for life