

## Think, Talk, and Write

- 1 Vocabulary** How strongly gravity pulls on an object's mass is the object's weight.
- 2 Classify** Which properties do solids and liquids share? Which are different?

Solids	Liquids
definite volume; definite shape; particles have less motion than liquids	definite volume; no definite shape; particles have more motion than solids

- 3 Critical Thinking** Would a balance on the Moon, which has one-sixth the gravity of Earth, still read masses correctly? Why or why not?

Yes, mass does not change based on location.

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- 4 Test Prep** Which property measures the space taken up by an object?
- A hardness  
 B mass  
 C volume  
 D weight

- 5 Test Prep** Which sample most likely has the lowest density?
- A liquid mercury  
 B mass  
 C volume  
 D weight

**Essential Question** How can the properties of matter be measured?

Possible answer: The properties of matter can be measured using various tools.

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For example an object's weight can be measured with a scale. Mass can be measured with an equal pan balance.

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properties of that element is a(n) atom.

- 2 Main Idea and Details** What are atoms like on the inside?

Main Idea	Detail
Atoms are mostly empty space, but are made of small particles.	Protons and neutrons are found in the nucleus.
	Electrons move around the nucleus.

- 3 Critical Thinking** Does a scanning tunneling microscope show atoms that resemble tiny beads? Why or why not?

Yes, it has a needle that moves up and down over single atoms. It might

show how the atoms are lined up in long strands like a string of beads.

- 4 Test Prep** Which element is most likely to conduct heat and electricity?

- A nitrogen
- B aluminum
- C helium
- D oxygen

- 5 Test Prep** Which element is most likely to be dull?

- A carbon
- B aluminum
- C mercury
- D sodium

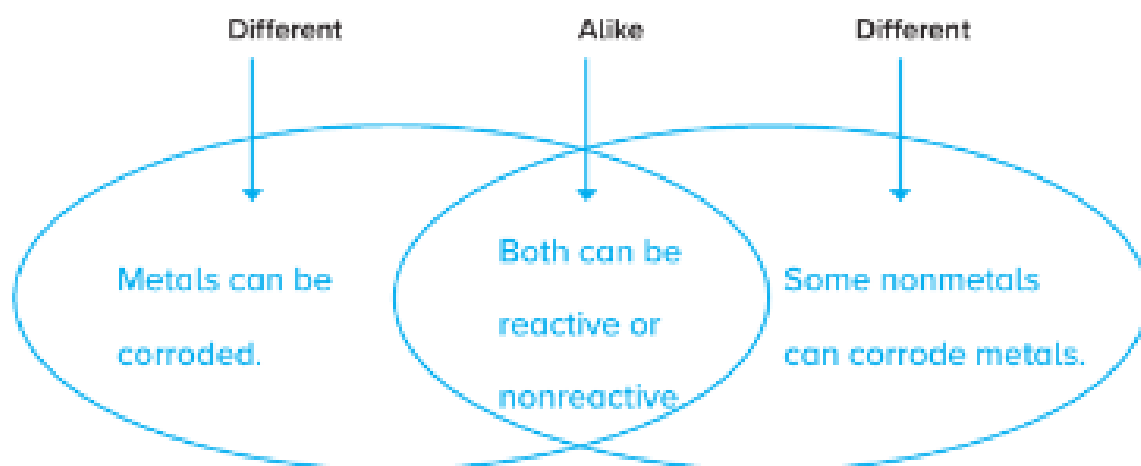
**Essential Question** What are the building blocks of matter?

Possible answer: The building blocks of matter are atoms of different elements.

## Think, Talk, and Write

1 **Vocabulary** The ability to be pulled into thin wires without breaking is ductility.

2 **Compare and Contrast** How are the chemical properties of metals and nonmetals similar and different?



3 **Critical Thinking** How could you use mercury to make a switch to turn on a light when the trunk of a car is opened?

Place a sealed cylinder partly filled with mercury on the trunk lid. When the lid is lifted, the mercury will flow to the bottom of the cylinder and close an electrical circuit, allowing electricity to flow.

4 **Test Prep** Which material is a metalloid?

- A brass
- B iron
- C boron
- D liquid nitrogen

**Essential Question** What are the properties of metals, nonmetals, and metalloids?

Metals conduct heat and electricity well, and are shiny, malleable, and ductile.

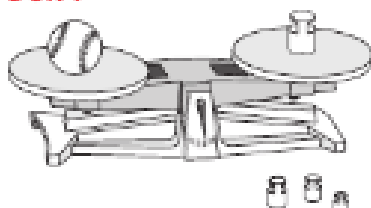
Nonmetals have properties opposite of metals. Metalloids have properties between metals and nonmetals.

# Test Preparation

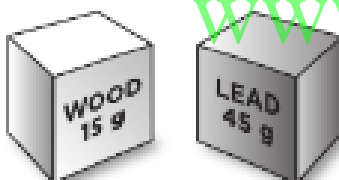
Circle the best answer for each question.

1. This instrument is used to measure the baseball's

**DOK 1**



- A** weight.  
**B** mass.  
**C** density.  
**D** volume.
2. Yousif is comparing the density of a block of wood to the density of a block of lead.



Which can Yousif conclude?

**DOK 2**

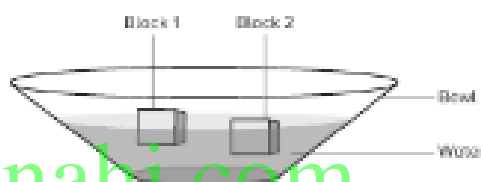
- A** The density of the block of wood is greater.  
**B** The density of the block of lead is greater.  
**C** Both objects have the same density.  
**D** The objects' densities cannot be determined.

3. Which test could a student do to determine if an object is a metal?

**DOK 2**

- A** Pound it with a hammer to see if it bends.  
**B** Scratch it on glass to see if it leaves a mark.  
**C** Place it in water to see if it sinks.  
**D** Add it to hydrochloric acid to see if it reacts.

4. Study the picture below.

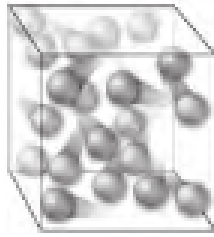


What can you conclude about the blocks in the water?

**DOK 2**

- A** The density of block 1 is greater than the density of block 2.  
**B** The density of block 2 is greater than the density of block 1.  
**C** Both blocks have the same density.  
**D** Block 1 is denser than water.
5. A copper coin would best be classified as a
- DOK 1**
- A** nonmetal.  
**B** molecule.  
**C** metal.  
**D** metalloid.

6. Study the picture below.



In which state of matter are the particles farthest apart?

**DOK 1**

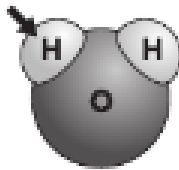
- A solid
  - B atom
  - C liquid
  - D gas**
7. Which has a negative charge?

**DOK 1**

- A nucleus
- B proton
- C electron**
- D neutron

8. The drawing below shows a water molecule. The arrow is pointing to a(n)

**DOK 2**



- A electron
- B atom.**
- C proton.
- D nucleus.

9. Scientists can use a scanning tunneling microscope to

**DOK 1**

- A** study the shape of a water molecule.
- B form new elements.
- C change the density of an object.
- D measure an object's weight.

10. The chemical formula for carbon dioxide is  $\text{CO}_2$ . Is carbon dioxide an element? Explain.

**DOK 2**

Carbon dioxide is not an element.

Elements cannot be broken down

into anything simpler. Carbon

dioxide can be broken down into

carbon and oxygen. Both carbon

and oxygen are elements.

## Vocabulary

DOK 1

Fill the blank with the best term from the list.

atom

mass

corrosion

matter

density

metal

element

molecule

malleability

volume

1. The ability to be bent, flattened, or hammered without breaking is called malleability.
2. You divide an object's mass by its volume to calculate its density.
3. The amount of space matter takes up is its volume.
4. The amount of matter in an object is its mass.
5. A material that cannot be broken down into anything simpler by chemical reactions is a(n) element.
6. Shiny luster, conductivity, and flexibility are all properties of a(n) metal.
7. The smallest unit of an element that still has the properties of that element is a(n) atom.
8. A particle made of two or more atoms is called a(n) molecule.
9. Anything that has mass and takes up space is called matter.
10. The gradual wearing away of a metal by combining with nonmetals is called corrosion.

# CHAPTER 5 Review

## Skills and Concepts

DOK 2-3

Answer each of the following.

11. Which measures an object's mass?
- A ruler
  - B pan balance
  - C spring scale
  - D graduated cylinder
12. All the elements in a column of the periodic table have
- A similar properties.
  - B the same number of protons.
  - C the same atomic mass.
  - D nothing in common.
13. In the table below, which terms should be placed in the column headings?

Elements in the Periodic Table

hydrogen	silicon	sodium
oxygen	boron	copper
sulfur	arsenic	mercury

- A Elements, Metals, Nonmetals
  - B Nonmetals, Metalloids, Metals
  - C Gases, Liquids, Solids
  - D Metalloids, Solids, Liquids
14. **True or False** *With a simple microscope, you can see atoms.* Is this statement true or false? Explain.
- False.** To see atoms you need special electron or scanning tunneling

microscopes.

15. **Main Idea and Details** How can two items of the same shape and size have different densities?

Density measures how much mass each millimeter of a substance has. Two items can have the same shape and size, but one may have more particles of mass inside it.

16. **Infer** You test an object made of an unknown element. You find that the object does not conduct electricity, looks dull, and breaks easily. How would you classify the element the object is made of?

The element is most likely a nonmetal.

17. **Classify** What type of structure does the picture show? What is it made of?



Accept molecule or oxygen molecule. It is made of two atoms.

18. **Critical Thinking** Why is it dangerous to hold a metal pole in a thunderstorm?

Metals conduct electricity. If the pole were hit by lightning, it could give the person holding it a dangerous shock.



19. How can you classify matter?

Possible answer: Properties that can help us classify matter include mass, weight, volume, density, state of matter, luster, conductivity, malleability, ductility, and hardness.