



Marks = /20 Grade 6 Science

Chapter 1 Practice Questions:

1. What factor is not changed in an experiment?

- a. independent variable
- b. temperature
- c. dependent variable
- d. constant

2. What is the one variable that is purposely changed to test a hypothesis called?

- a. constant variable
- b. independent variable
- c. responding variable
- d. operational variable

3. When completing an experiment, the dependent variable is the variable that

- a. you are testing or manipulating.
- b. you are measuring.
- c. is kept that same in all trials.
- d. is changed by the scientist.

4. An experiment is a specific test of a .

- a. control
- b. hypothesis
- c. theory
- d. variable

5. Which variable represents the data that is collected during the trials and depends on the results?

- a. the independent
- b. the x variable
- c. the dependent
- d. the conclusion

6. A symbol or a letter that stands for a number.

- a. digit
- b. variable
- c. number
- d. factor

7. A symbol or a letter that stands for a number.

- a. compose
- b. variable
- c. number
- d. digit



8. In an experiment, to change something or make something different, is known as the

- a. Independent Variable
- b. Dependent Variable
- c. Controlled Variable

9. In an experiment when you keep some things the same, this is known as the

- a. Independent Variable
- b. Dependent Variable
- c. Controlled Variable
- d. No Variable

10. A student hypothesized that the amount of sunlight a sunflower plant receives determines the number of sunflower seeds the plant produces. In her experiment, the number of seeds produced is the

- a. independent variable
- b. dependent variable
- c. controlled variable
- d. uncontrolled variable

Section 2

1. Why is it important to only change one variable at a time during an experiment?

2. The experimental factor that is manipulated; the variable whose effect is being studied is the _____.

3. A prediction about how something works or how two variables are related

4. When doing an experiment, the _____ is variable that does not change throughout the entire experiment, and the _____ is the variable that changes because the scientist manipulates it.

5. In an experiment, the _____ is the part of the experiment that is changed by the scientist. For example, the amount of fertilizer given the plants is changed to see the differences in the plant growth.

6. _____ is the variable that must remain the same in all situations.

7. What are the differences between Constant, Independent and Dependent variables?

Constant: _____

Independent: _____

Dependent: _____



8. In an experiment, the _____ is the part of the experiment that is being observed or measured. For example, height would be the what is measured in an experiment about how different fertilizers effect plant growth.

_____ is the single factor that is changed in an _____.

Grade 6 Science Summary
AY 2017-2018- Term1

Chapter 3

The Big Idea: How does energy cause change?

Lesson 3.1 Types of energy

Essential Question: What is energy?

Success Criteria:

- Energy is the ability to cause change.

Essential Question: What are the different forms of energy?

Success Criteria:

- Kinetic energy is the energy an object has because it is in motion.
- Kinetic energy depends on mass. If something has less mass it has less kinetic energy than something with more mass.
- Electric energy is a form of kinetic energy that an electric current carries.
- Potential energy is stored energy that depends on the interaction of objects, particles, or atoms. • Gravitational Potential Energy is a potential energy stored in an object due to its height above Earth's surface.
- The further an object is from Earth's surface, the more Gravitational Potential Energy it has.
- Chemical energy is the energy that is stored in and released from the bonds between atoms.
- Nuclear energy is energy stored in and released from the nucleus of an atom.
- Mechanical Energy is the sum of potential energy and kinetic energy in a system of objects.
- Thermal energy is the sum of kinetic energy and potential energy in the particles that make up an object.
- Geothermal energy is the thermal energy from the particles in Earth's interior.
- Sound energy is an energy carried by sound waves.
- Sound energy travels in the air.
- Seismic Energy is the energy transferred by waves moving through the ground.
- Radiant energy is the energy carried by electromagnetic waves.
- The sun's energy is transmitted to Earth by electromagnetic waves.

Essential Question: **How is energy used?**
Success Criteria:

- Energy is used to move cars, heat homes, produce light, move muscles, catch prey, and cook food.

Lesson 3.2 Energy Transformations and Work

Essential Question: **What is the law of conservation of energy?**

Success Criteria:

- Energy transformation is the conversion of one form of energy to another.
- The Law of Conservation of Energy says that energy cannot be created or destroyed; it can be transformed from one form to another.

Essential Question: **In what ways can energy be transformed?**
Success Criteria:

- Energy is transformed from one kind into another.
- Energy is also transferred when it moves from one object to another.
- **EXAMPLES:**
 - The *electric energy* in the wiring of a heat lamp is transformed into *thermal energy*
 - When the blades of wind turbines rotate they turn a generator that changes the *kinetic energy* of the moving blades into *electric energy*.
 - Hydroelectric energy plants convert the *gravitational potential energy* of water into *electric energy*.
 - Burning fossil fuels breaks the bonds of its atoms apart changing *chemical energy* into *thermal energy*.

Essential Question: **How are energy and work related?**
Success Criteria:

- Work is the transfer of energy that occurs when a force makes an object move in the direction of the force while the force acts on the object.
- Work depends on the amount of force applied to an object.
- Work also depends on the distance the object moves.
- **CALCULATING WORK** work (in joules) = force (in newtons) X distance (in meters)
 $w = Fd$
- Doing work on an object transfers energy to the object.

Lesson 3.3 Machines

Essential Question: What are simple machines?

Success Criteria:

- Simple machines are machines that do work using one movement.
- Simple machines do not change the amount of work required to do a task, they only change the way work is done.
- **EXAMPLES OF SIMPLE MACHINES**
 - An inclined plane is a flat, sloped surface.
 - A screw is an inclined plane wrapped around a cylinder.
 - A wedge is an inclined plane that moves.
 - A lever is a simple machine that pivots around a fixed point.
 - A wheel and axle is a shaft attached to a wheel of a larger diameter so that both rotate together.
 - A pulley is a grooved wheel with a rope or cable wrapped around it.
- A **complex machine** is two or more simple machines working together.
- Efficiency is the ratio of output work to input work.
- Efficiency is the measure of how much work put into the machine is changed into useful output work.
- **EFFECIENCY EQUATION**

$$\text{efficiency}(in \%)= \frac{\text{output work (in J)}}{\text{input work (in J)}} \times 100\% = \frac{W_{out}}{W_{in}} \times 100\%$$

Essential Question: In what ways can machines make work easier.

Success Criteria:

- Machines make work easier by changing the size of the force required, the distance over which the object moves, or the direction of the input and output forces.

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Chapter 4

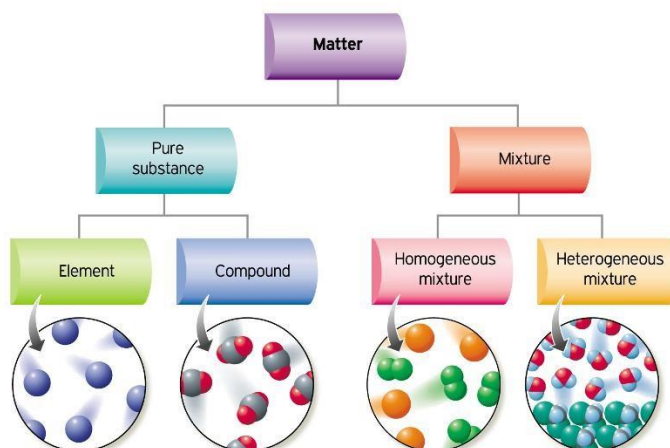
The Big Idea: How does the classification of matter depend on atoms?

Lesson 4.1 Substances and Mixtures

Essential Question: What is the relationship among atoms, elements, and compounds?

Success Criteria:

- Matter is anything that has mass and takes up space.
- An atom is a building block of matter.
- An element is matter made of only one type of atom.
- A substance is matter made with a composition that is always the same.
- A molecule is two or more atoms held together by chemical bonds and acts as a unit.
- A compound is a substance made of two or more elements that are chemically joined in a specific combination.



Essential Question: How are some mixtures different from solutions?

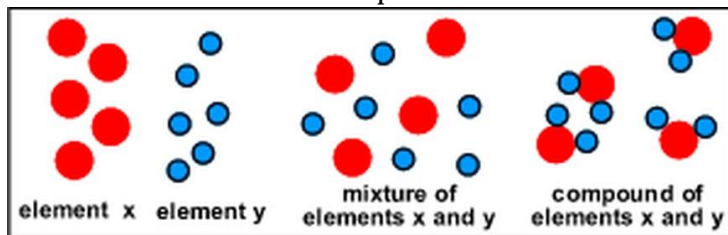
Success Criteria:

- A mixture is matter that can vary in composition.
- A mixture is made of two or more substances that are blended but are not chemically bonded.
- A heterogeneous mixture is a mixture in which the substances are not evenly mixed.
- A Heterogeneous mixture is not a solution.
- A Homogenous mixture is a mixture in which two or more substances are evenly mixed, but not bonded together.
- A Homogenous mixture is a solution.
- A Heterogeneous mixture can be separated into parts by filtering, using magnets, decanting, or adding heat.

Essential Question: How do mixtures and compounds differ?

Success Criteria:

- The properties of the *compound* are different from the properties of the atoms that make it up.



- The atoms that make up a given *compound* are bonded together.
- Changing the composition of a *compound* makes a new compound.

Lesson 4.2 The Structure of Atoms

Essential Question: Where are protons, neutrons, and electrons located in an atom?

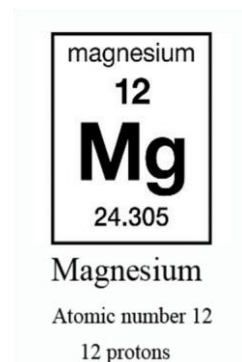
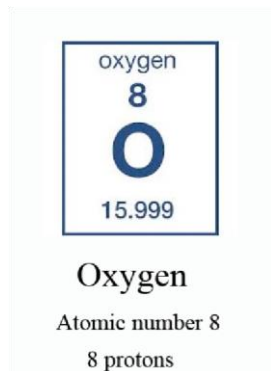
Success Criteria:

- The Nucleus is the region at the center of an atom that contains most of the mass of the atom.
- The nucleus is made up of protons and neutrons.
- Protons are positively charged particles in the nucleus of an atom.
- Neutrons are uncharged particles in the nucleus of an atom.
- Electrons are negatively charged particles that occupy the space in an atom outside of the nucleus.
- Electron Cloud is the region surrounding an atom's nucleus where one or more electrons are most likely to be found.

Essential Question: How is the atomic number related to the number of protons in an atom?

Success Criteria:

- Atomic number is the number of protons in the nucleus of an atom of an element.
- The identity of an atom is determined by its atomic number.



Essential Question: What effect does changing the number of particles in an atom have on the atom's identity?

Success Criteria:

- An isotope is one of two or more atoms of an element having the same number of protons, but a different number of neutrons.
- An ion is an atom that has a charge because it has gained or lost electrons.
- A change in the number of *neutrons* or *electrons* causes the identity of the atom to stay the same.
- A change in the number of *protons* of an atom results in a *new* element with a new identity.

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Chapter 4 Practice Questions:

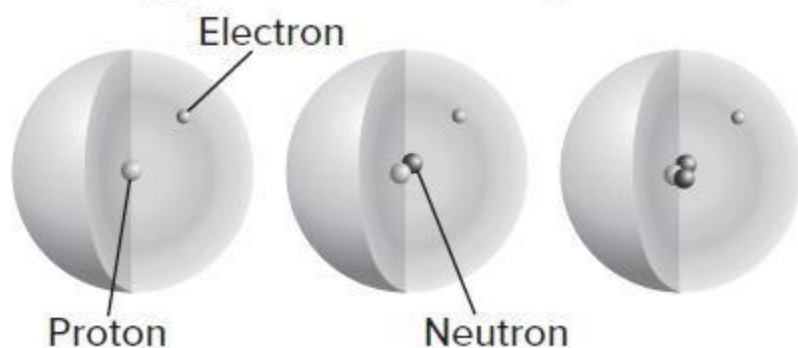
Use the figure below to answer questions 1 and 2.



- How many atoms are in the particle?
A 1 **B** 2
C 3
D 5
- Which kind of matter might contain only this type of particle?
A a compound
B an element
C a heterogeneous mixture **D** a homogeneous mixture
- Which class of matter is the least evenly mixed?
A compounds
B heterogeneous mixtures
C homogeneous mixtures **D** solutions
- Which correctly describes a compound but not a mixture?
A All the atoms are of the same element.
B All the molecules have at least two atoms.
C The combination of substances never changes.
D The substances can be separated without breaking bonds.
- A girl pours a spoonful of sugar into a glass of warm water. She stirs the water until the sugar disappears. When she tastes the water, she notices that it is now sweet. Which describes the kind of matter in the glass?
A a compound
B an element
C a solution
D a substance

- 6 How could you separate a mixture of stone and wooden beads that are all the same size?
- A Add water to the mixture and skim off the wooden beads, which float.
 - B Heat the mixture until the stone beads melt.
 - C Strain the mixture to separate out the stone beads.
 - D Use a magnet to pull out the wooden beads.

Use the figure below to answer question 7.



- 7 The figure shows models of three different atoms. What can you conclude about the three models shown in the figure?
- A They all show positive ions.
 - B They all show negative ions.
 - C They all show the same element.
 - D They all show the same isotope.
- 8 What is the atomic number of an atom that has 2 electrons, 3 protons, and 4 neutrons?
- A 2
 - B 3
 - C 4
 - D 7
 - E

Use the table below to answer questions 9 and 10.

	Number of Protons	Number of Neutrons	Number of Electrons
A	8	8	8
B	8	8	10
C	8	9	8
D	9	10	9



9 The table shows the numbers of protons, neutrons, and electrons for four atoms. Which atom has a negative charge?

- A A
- B B
- C C
- D D

10 Which of the atoms is a different element than the others?

- A A
- B B
- C C
- D D

Section 2

1. Atomic mass - _____ = number of neutrons in an element.

2. What does the atomic mass tell us?

3. What is on the element key?

4. The part of an atom with no charge is a _____.

5. What is an element?

6. If the nucleus of an atom contains 12 protons, how many electrons are there in a neutral atom?

Explain.

7. Matter is made up of _____.

8. What does the atomic number represent? _____

9. _____ and _____ are found in the nucleus of an atom.

10. _____ positively-charged particle in the nucleus of an atom

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Chapter 4 Practice Questions:

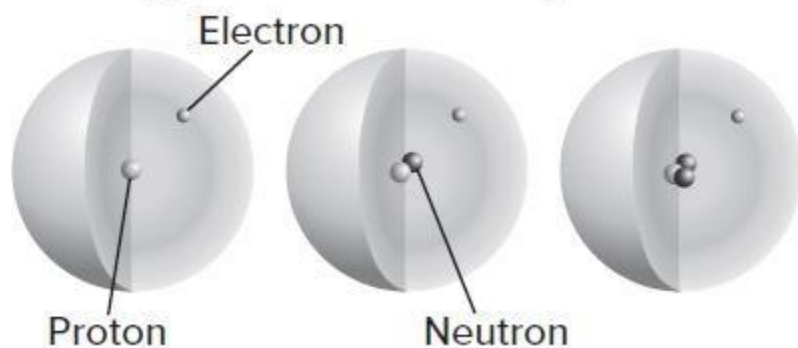
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B an element
C a heterogeneous mixture D a homogeneous mixture
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 - C 4
 - D 7

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- A A
 - B B**
 - C C
 - D D

10 Which of the atoms is a different element than the others?

- A A
- B B
- C C
- D D**

Section 2

1. Atomic mass - **Atomic Number** = number of neutrons in an element.
2. What does the atomic mass tell us? **mass of an atom of an element in atomic mass units**
3. What is on the element key?
Atomic number, atomic mass, ionic charge, and chemical symbol.
4. The part of an atom with no charge is a **neutron**.
5. What is an element? **pure substance with only one type of atom**
6. If the nucleus of an atom contains 12 protons, how many electrons are there in a neutral atom? Explain.
There are 12 electrons. To be neutral, an atom must have the same number of electrons as protons.
7. Matter is made up of **atoms**.
8. What does the atomic number represent? **number of protons**
9. **Protons** and **Neutrons** are found in the nucleus of an atom.
10. positively-charged particle in the nucleus of an atom **proton**

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Chapter 5

The Big Idea: **What gives a substance its unique identity?**

Lesson 5.1 Matter and Its Properties

Essential Question: **How do particles move in solids, liquids, and gases?**

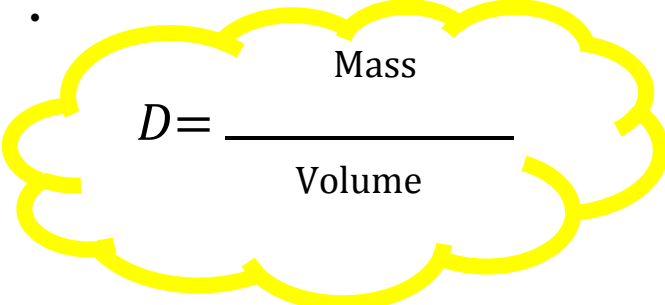
Success Criteria:

- Volume is the amount of space a sample of matter occupies.
- A solid is a state of matter with a definite shape and volume.
- Particles of a solid are close together and vibrate about a definite position.
- A liquid is a state of matter with a definite volume but not a definite shape.
- Particles of a liquid are close together and can slide past one another.
- A gas is a state of matter without a definite shape or a definite volume.
- Particles of a gas are very far apart and move freely within their container.

Essential Question: **How are physical properties different from chemical properties?**

Success Criteria:

- A physical property is a characteristic of matter that you can observe without changing the identity of the substances that make it up.
- Some physical properties of matter are mass, volume, density, solubility, melting and boiling point.
- Mass is the amount of matter in an object.
- Density is the mass per unit volume of a substance.
- The formula for calculating density


$$D = \frac{\text{Mass}}{\text{Volume}}$$

- Solubility is the ability of one material to dissolve into another.
- A Chemical Property is the ability of a substance to combine or change into one or more new substances.
- Some chemical properties of matter are flammability, and the ability to rust.

Essential Question: **How are properties used to identify a substance?**

- Success Criteria:**
- You can identify an unknown substance by comparing its properties to those of other known substances.
 - Melting point and density are reliable physical properties used to identify an unknown substance.

Lesson 5.2 Matter and its Changes

Essential Question: **How are physical changes different from chemical changes?**

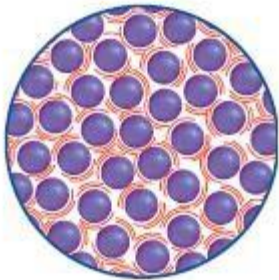
- Success Criteria**
- A Physical change is a change in the size, shape, form, or state of matter in which the identity of the matter stays the same.
 - Examples of physical changes are dissolving, and changing state.
 - A Chemical Change is a change in matter in which the substances that makes it up changes into other substances with different chemical and physical properties.
 - Examples and signs of chemical changes are burning, the formation of gas, formation of precipitate, and color change.
 - When two liquids react and form solid particles, this new solid is a precipitate.
 - All chemical reactions involve energy changes.
 - Thermal or light energy is often needed for a chemical reaction to take place, and is given off during the reaction.

Essential Question: **How do physical and chemical changes affect mass?**

- Success Criteria:**
- Physical and chemical changes do not affect the mass of a substance.
 - The Law of Conservation of mass states that the total mass before a chemical reaction is the same as the total mass after the chemical reaction.

**Marks = /20 Grade 6 Science****Chapter 5 Practice Questions:**

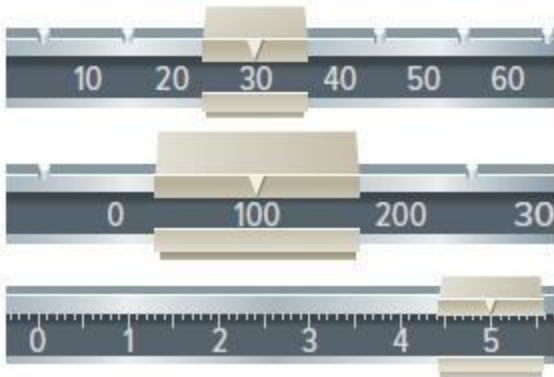
1. Which is a property of all solids? **A.** Particles are far apart.
B. Particles vibrate in all directions.
C. Volume and shape can easily change.
D. Weak forces exist between particles.
2. Which characteristic is a chemical property?
A. highly flammable
B. mass of 15 kg
C. woolly texture
D. golden color
3. Which property of an object depends on its location?
A. density **B.** mass
C. volume
D. weight
4. How are the particles of a gas different from the particles of a liquid shown here?



- A.** They move more slowly.
B. They are farther apart.
C. They have less energy.
D. They have stronger attractions.
5. Which is a physical change?
A. burning natural gas
B. chopping onions
C. digesting food
D. exploding dynamite
6. Which stays the same when a substance changes from a liquid to a gas?
A. density
B. mass
C. forces between particles **D.** distance between particles
7. Which is a chemical change?
A. boiling water



- B. copper turning green in air
C. freezing fruit juice
D. slicing a potato
8. Which would be most useful for identifying an unknown liquid?
A. density B. mass
C. volume
D. weight
9. What mass is measured on this balance?



- A. 35 g
B. 45 g
C. 135 g
D. 145 g
10. What causes a chemical reaction when you prepare scrambled eggs?
A. removing the eggs from the shells
B. mixing the egg yolks and the egg whites together
C. heating the eggs in a pan
D. sprinkling pepper onto the cooked eggs

Section 2

1. Matter is _____
2. List four properties of matter:
a) _____
b) _____
c) _____
d) _____
3. _____ properties of matter are properties that can be measured or observed without matter changing into a different substance.

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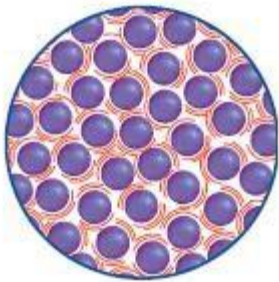
4. List 6 physical properties of matter.
- a) _____
 - b) _____
 - c) _____
 - d) _____
 - e) _____
 - f) _____
5. Chemical properties are the characteristics of that can only be observed when the substance _____.
6. Describe the properties of metal.
- a) _____
 - b) _____
 - c) _____
 - d) _____
7. In addition to physical properties, substances have _____ that describe how a substance reacts with another substance.
8. Matter can be a _____ , _____ , or _____.
9. Liquids have a definite _____, but no definite _____ .

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Chapter 5 Practice Questions:



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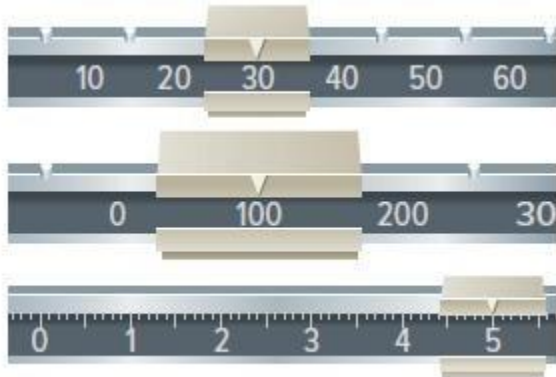
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C. freezing fruit juice
D. slicing a potato



8. Which would be most useful for identifying an unknown liquid?

- A. density
- B. mass
- C. volume
- D. weight

9. What mass is measured on this balance?



- A. 35 g
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10. What causes a chemical reaction when you prepare scrambled eggs?

- A. removing the eggs from the shells
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- C. heating the eggs in a pan
- D. sprinkling pepper onto the cooked eggs

Section 2

1. Matter is **anything that occupies space, has weight, and can exist as a solid, liquid, or gas.**

2. List four properties of matter:

- a) mass
- b) volume
- c) density
- d) weight

3. **Physical** properties of matter are properties that can be measured or observed without matter changing into a different substance.

4. List 6 physical properties of matter.

- a) **Hardness**
- b) **color**
- c) **smell**
- d) **boiling and freezing point**
- e) **conductivity**

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f)ability to dissolve

5. Chemical properties are the characteristics of **matter** that can only be observed when the substance **changes into a different substance**.

6. Describe the properties of metal.

a)good conductors

b)shiny

c)ductile

d)malleable

7. In addition to physical properties, substances have **chemical properties** that describe how a substance reacts with another substance.

8. Matter can be a **solid, liquid, or gas**.

9. Liquids have a definite **volume**, but no definite **shape**