Summary & Practice Sheets

Grade 6

Methods of Science
Technology and the Design Process
Matter and Atoms
Matter: Properties and Changes
Solubility, and Acid/Base Solutions

The Scientific Method

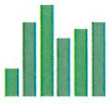
1. **Make Observations**
(use your senses to gather information)

2. **Ask a Question**

3. **Formulate a Hypothesis**
(explanation that can be tested)

4. **Test a Hypothesis**
(design an experiment, research, or more observations)

5. **Collect Data**



6. **Draw a Conclusion**
(a written summary that states whether the hypothesis is correct or not)

Practice - The Scientific Method

1. Let's Match: Find the matching example for each step of the scientific method.

Scientific Method	Examples
Make observations	• Conduct an experiment using different amounts of water on the same plant.
Ask a question	• Observe which amount of water makes plants grow taller.
Formulate a hypothesis	• If you use more water the plants will grow taller. If you use less water the plants will not grow as tall.
Test a hypothesis	• Different amount of water are needed to make plants grow taller. However, some plants grow with less water.
Collect data	• Does the amount of water make plants grow taller?
Draw a conclusion	• Plants that are watered more will grow taller.

2. Fill in the blanks using the terms from the word bank.

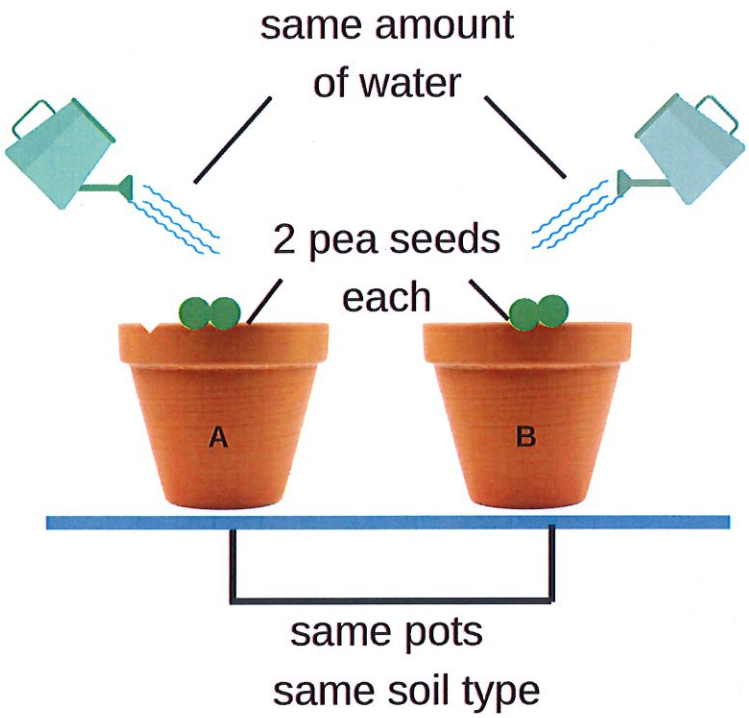
inferences	six	observations	hypothesis	scientific method

1. The scientific method is a process that uses six different steps to answer questions or test ideas.

2. A hypothesis is a possible explanation of a set of observations that can be tested.

3. Observations are what you notice using your five senses. These observations lead to different reactions, thoughts, and explanations, called inferences.

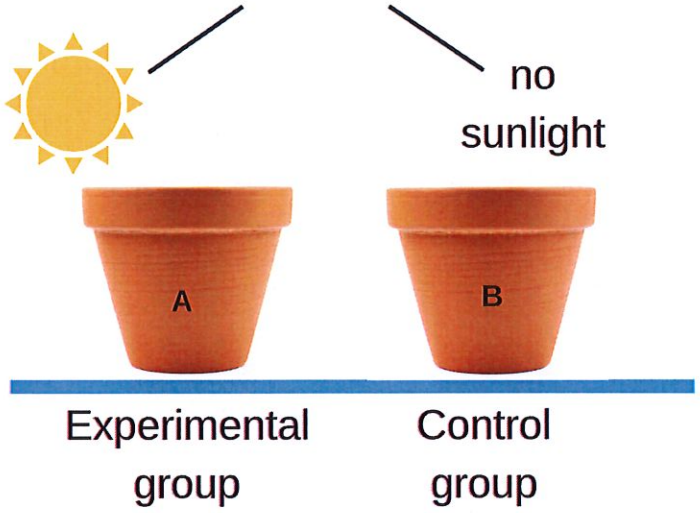
What is a variable?



Independent variable

The variable that is changed in the experiment.

Independent variable: amount of sunlight



Dependent variable

The variable that is measured in the experiment.

Dependent variable: height of pea plant

Practice - Variables

1. Fill in the blanks

The ___independent___ variable is the factor that does not depend on another variable.

The ___dependent___ variable is the factor that depends on the independent variable.

The ___control___ variable is the factor that stays the same so you can measure the changes.

2. Identify the dependent and independent variables in each problem.

a. Which brand of soap makes the biggest bubble?

- brand of soap ___independent___
- size of the bubbles ___dependent___

b. Which brand of soil makes the plants grow taller?

- height of the plant ___dependent___
- brand of soil ___independent___

c. Does listening to music while running make you run faster?

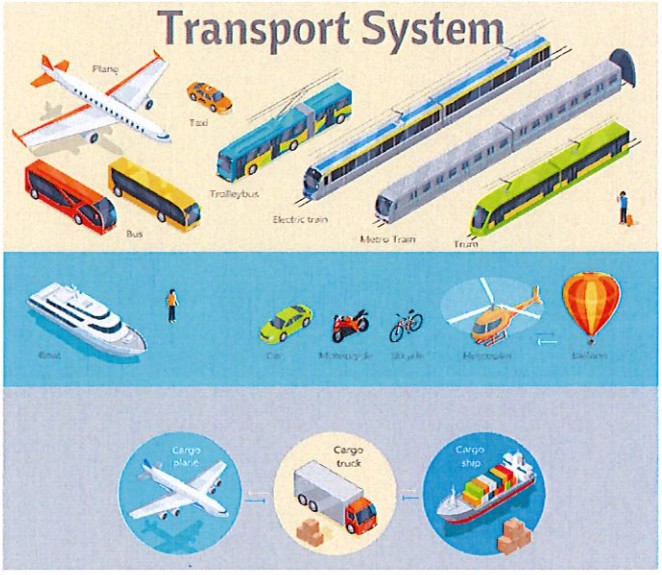
- music ___independent___
- speed while running ___dependent___

Systems and Subsystems

What is a system?

A system is a group of organized parts that work together to do a job. There are different types of systems.

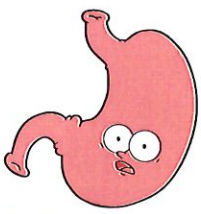
A group of different organs that work together to break down food.



A group of different parts that move people or goods from one place to another.

What is a subsystem?

A subsystem is a part of a system or it can be a small system in larger one.

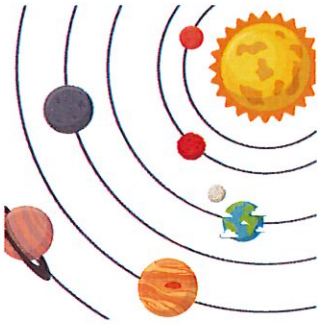


Stomach is a part of the digestive system. It helps break down food.

A car is part of the transport system. It is also a small system made of different parts.

Practice: System or Subsystem

1. Fill in the blanks by system or subsystem to complete each sentence.

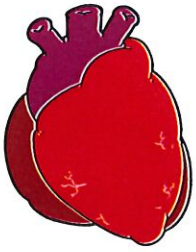


The Sun and the planets are parts of the solar _____system_____.

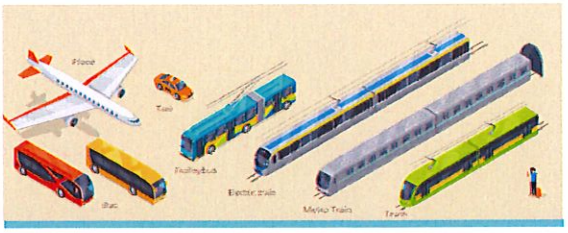
The Earth is a _____subsystem_____ in the solar system.

The wheels, chain, pedals, and seat are all parts of the bicycle _____system_____.

The human body is made up of many different parts that work together for it to function. It is a _____system_____.



The heart is a _____subsystem_____ in the circulatory system.



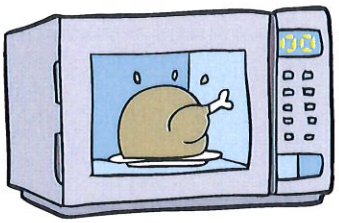
The cars, planes, buses, and trains are all parts of the transportation _____system_____.

System Diagrams

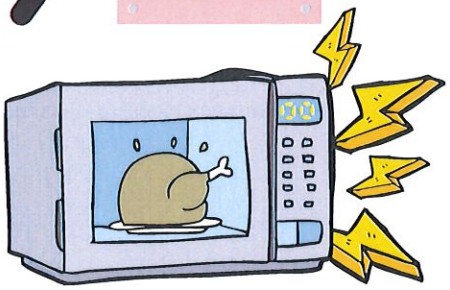
Systems can be diagrammed in two different ways to show how the parts relate to each other.

1 Open-Loop System: is a system that has no feedback and needs human input.

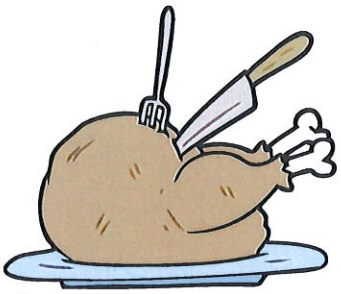
Input → **Process** → **Output**



You set up the time and press start to turn on the microwave.



The microwave turns on and heats your food.



When the microwave turns off, you have to check if your food is heated.

2 Closed-Loop System: is a system that uses feedback from the output to control the input.

Input → **Process** → **Output**

You turn on the Iron.

Iron heats up.

Iron is hot enough.

Iron is turned off and turns on again when it cools.

Feedback

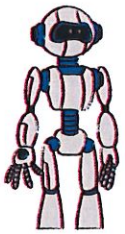
Practice: System Diagrams

1. Match each term with its correct description.

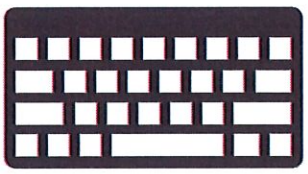
open-loop system	controlled by human
automatic control	has a feedback from output on input
closed-loop system	programmed device that works without human input
manual control	has no feedback and needs human input

2. Label each picture as a manual or an automatic control.

manual

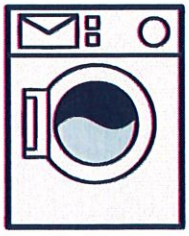


automatic



manual

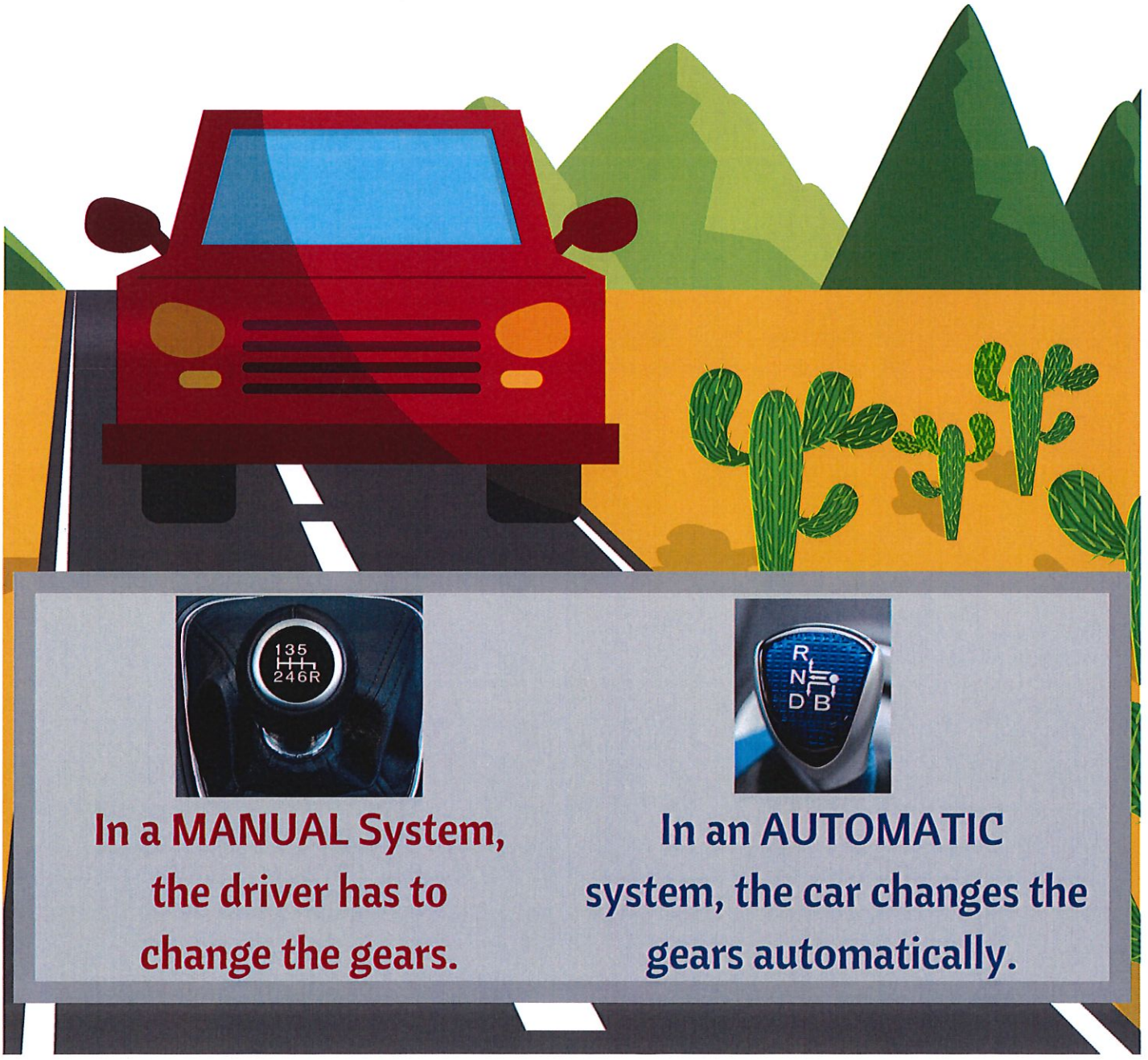
automatic



automatic

manual

What's the Difference Between MANUAL and AUTOMATIC?

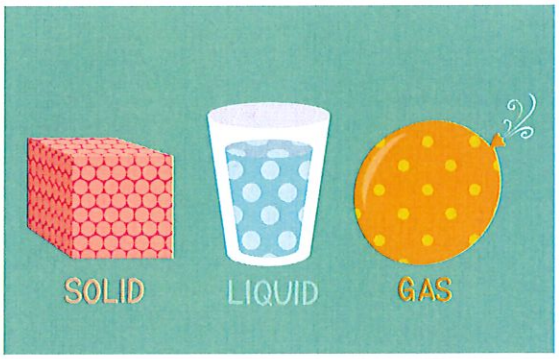


In a MANUAL System, the driver has to change the gears.

In an AUTOMATIC system, the car changes the gears automatically.

Mass MATTERS!

You have learned matter is anything that takes up space and has a mass.
Matter can be SOLID, LIQUID, or GAS.
Energy does not have mass and is NOT matter.



Matter

substances that are always made up of the same thing

2 or more pure substances

- **Pure Substances**
  - **Elements** — *substances made up of 1 type of atom*
  - **Compounds** — *substances made up of 2 or more elements*
- **Mixtures**
  - **Homogeneous** — *evenly mixed*
  - **Heterogeneous** — *NOT evenly mixed*

Examples

1. **ELEMENTS**
   gold, helium, hydrogen, oxygen
2. **COMPOUNDS**
   water (H_2O) , carbon dioxide (CO_2)
3. **HOMOGENEOUS**
   salt water, air, lemonade
4. **HETEROGENEOUS**
   salad, sand & water, burger

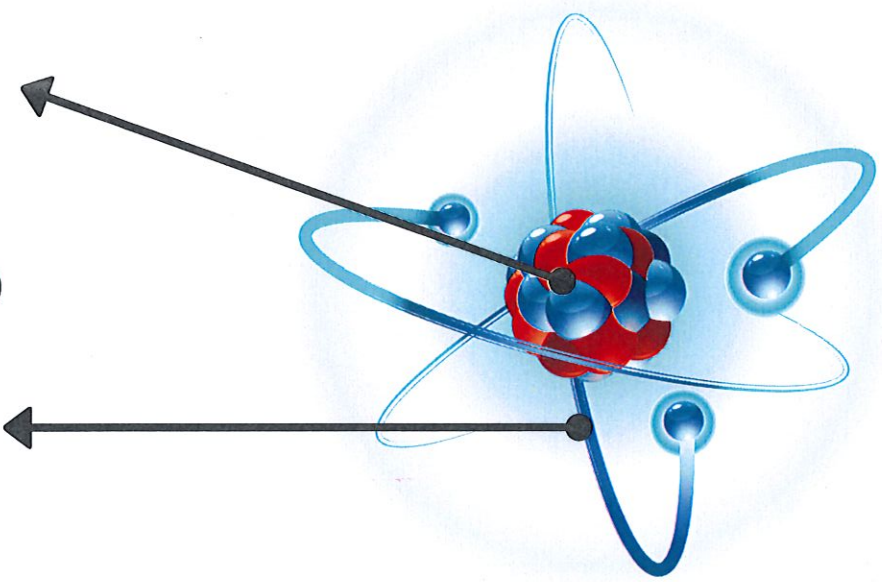
ALL about ATOMS!

NUCLEUS

- the center of every atom
- has protons (+ charge)
- has neutrons (no charge)

ELECTRON CLOUD

- around the nucleus
- has electrons (- charge)
- mostly empty space



ELEMENTS

ELEMENT NAME

ATOMIC NUMBER
(number of protons)

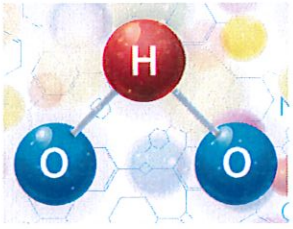
SYMBOL

ATOMIC MASS

COMPOUNDS

When 2 or more elements CHEMICALLY BOND together.

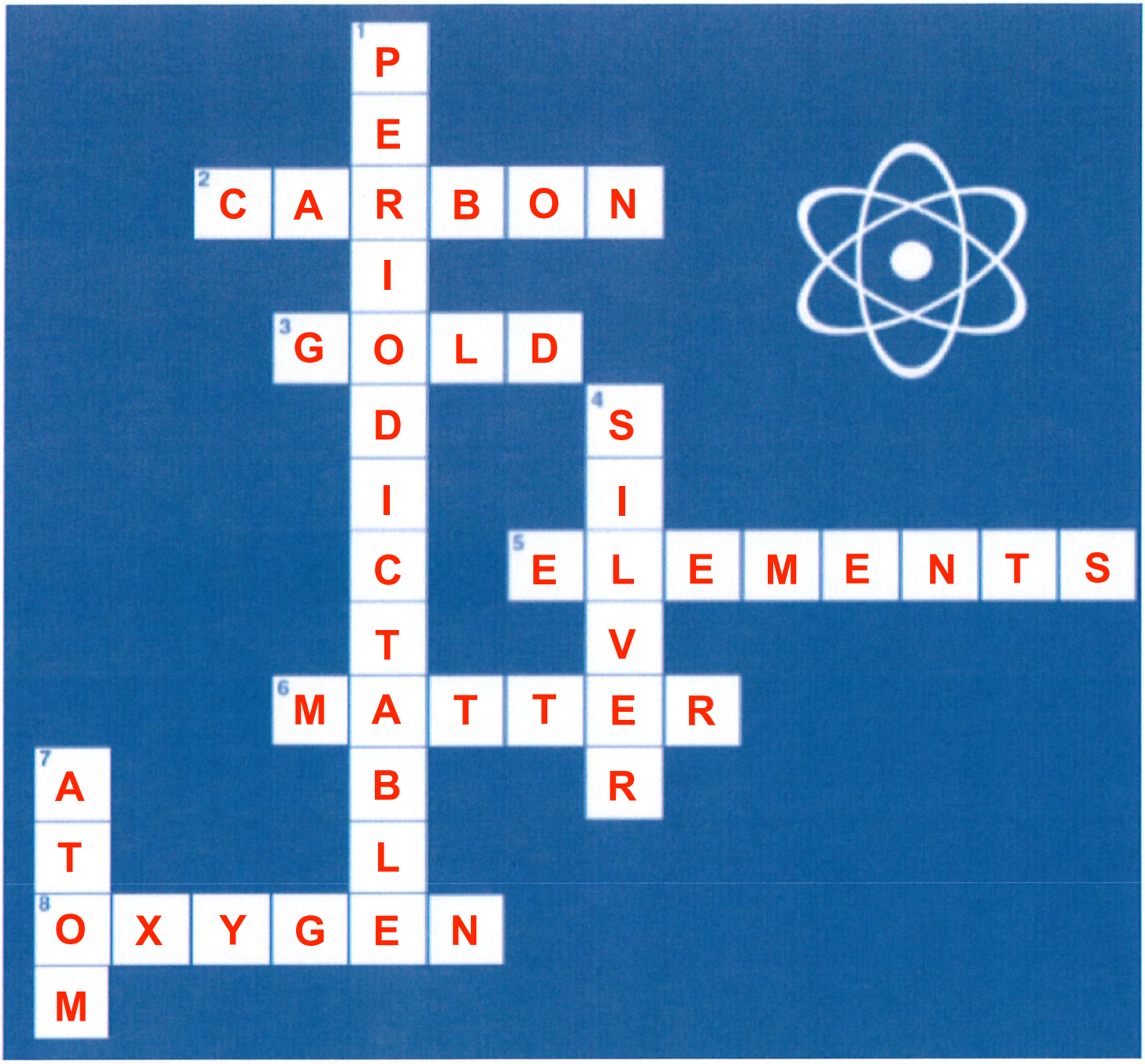
Name	Chemical Formula	Molecular Structure
Water	H_2O	



Water contains
1 hydrogen and 2 oxygens.

How many carbon atoms are in one molecule of $C_6H_{12}O_6$?

PRACTICE-MATTER & ATOMS



Across →

2. Has a chemical symbol (C) and an atomic number = 6.

3. A shiny metal used for jewellery.

5. There are 115 of them arranged in a chart.

6. has mass and takes up space.

8. A gas in the air

Down ↓

1. A chart where all elements are arranged.

4. The second place medals are made of this shiny metal.

7. Tiny particles that make up all elements.

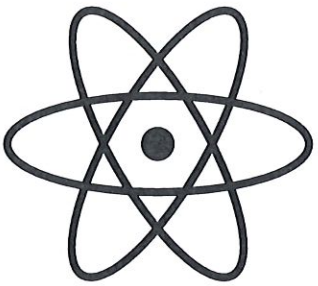
PRACTICE-MATTER & ATOMS

True or False?

1. Scientists can see atoms with microscopes. False
2. Neutrons are positively (+) charged. False
3. The center of the atom is called the brain. False
4. Protons are found in the electron cloud. False

Fill in the Blanks!

This is a picture of an atom. The center is called the nucleus and the outside is called the electron cloud



Lets Match!

- Name
- Symbol
- Atomic Number
- Atomic Mass

Pick the correct answer.

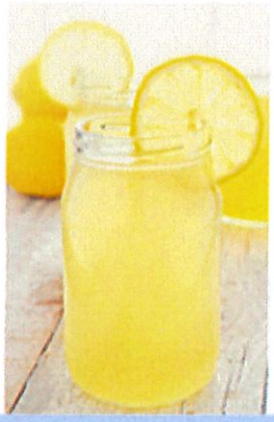
1. Oxygen has an atomic number of 8. How many protons does oxygen have?

A. 4
B. 8
C. 16

2. What are atoms made up of?

A. electrons
B. protons
C. neutrons
D. all of the above

Homogeneous vs. Heterogeneous



Homogeneous

- Two or more substances are equally mixed.
- Not all the substances are seen
- They are also called solutions.
- Solution is made of a solute (sugar) and a solvent(water).
- Examples: tea, salt water, orange juice.

vs

substances physically mix

Heterogeneous

- Two or more substances are not equally mixed.
- All the substances are seen.
- They can be in solids, liquids, gases. Or two or more different states together.
- Examples: Nuts, salad, air, sparkling water.

Parts of a Solution (Homogeneous)

Water
250 mL

+

Lemon Juice
45 mL

+

Sugar
52 mL

=

Lemonade

Which ingredient is the most in the lemonade? WATER

Water is the SOLVENT.

Lemon juice and sugar are the SOLUTES.

SOLVENT + SOLUTE = SOLUTION

PRACTICE-MATTER

Classify the following pictures as a pure substance, homogeneous mixture or heterogeneous mixture.

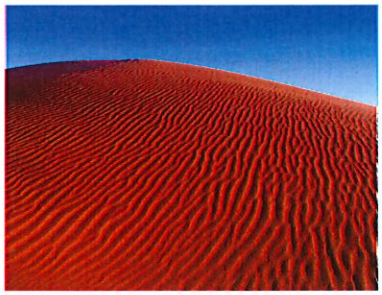
pure substance

heterogeneous

homogeneous

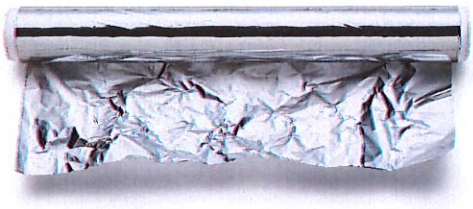
heterogeneous

pure substance



homogeneous

heterogeneous



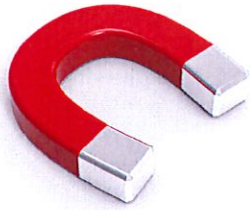
pure substance

Separating MIXTURES!

You can use different ways to separate mixtures

Magnetism

Separate metals from non-metals using a magnet.
example: paper clips and rubber bands



Picking Apart

Big substances can be picked by hand.
example: crayons and pens

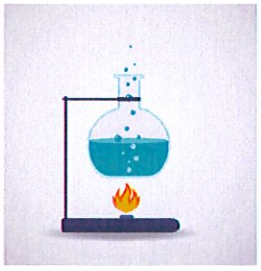
Filtration

Separate particles that don't dissolve in liquids.

examples:
rocks and water
coffee and water

Evaporation

Separate solids that dissolve in a liquid.
example: water and sugar



Distillation

Separate solvent from a solution by heating and then cooling.
example: water from another liquid

PRACTICE-SEPARATING MIXTURES

1. Decide how can you separate the different mixtures below.

pasta and water

filtration

sand and water

filtration

iron nails and sand

magnetism

sugar and water

evaporation

2. What does the picture show? Explain.

distillation

Revision Sheets

Chapter 3 - Matter and Atoms

Answer the following questions.

Part A- True/False

Indicate whether the statement is true or false.

F 1. For an atom to be neutral, the number of protons must equal the number of neutrons.

T 2. A solution is a homogeneous mixture.

F 3. Salad oil dissolves quickly in vinegar to form a solution.

F 4. An element is another name for a solution

F 5. Table salt is an example of a pure substance

Part B- Multiple Choice

Identify the choice that best completes the statement or answers the question.

B 6. The atomic number of calcium is 20. What can you tell about an atom of this element?

a. the sum of its protons and neutrons is 20
b. it has 20 protons
c. it has 40 protons
d. it has 20 neutrons

C 7. Which part of the atom has the most mass?

a. electron cloud
b. space around the nucleus
c. nucleus
d. All parts of the atom are equally dense.

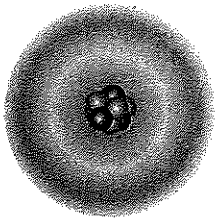
D 8. How small are atoms?

a. about the size of dust specks
b. about the size of pin holes
c. about the size of grains of salt or sand
d. too small to be seen by the unaided eye

A 9. The sum of an atom's protons and neutrons is its _____.

a. average atomic mass
b. periodic number
c. atomic number
d. atomic weight

A ___ 10. What are the smallest particles of an element that have the same chemical properties as the element?



a. atoms
b. molecules
c. protons
d. electrons

B ___ 11. When two pure substances are blended together, but not chemically bonded the resulting matter is called a _____.

a. compound
b. mixture
c. element
d. isotope

C ___ 12. The atmosphere of Earth is composed of nitrogen, oxygen, and carbon dioxide. This is an example of a ____ solution.

a. liquid-liquid
b. gas-liquid
c. gas-gas
d. solid-liquid

B ___ 13. Which would you most likely be able to separate into its individual parts by filtering?
a. heterogeneous mixture of two liquids
b. heterogeneous mixture of two solids
c. homogeneous mixture of two liquids
d. homogeneous mixture of two solids

C ___ 14. Which is true about carbon-12 compared with carbon-13?
a. Carbon-12 has more neutrons
b. Carbon-12 has more protons
c. Carbon-13 has more neutrons
d. Carbon-13 has more protons

Part C- Matching

Match each term with its correct description

a. atom
b. atomic number
c. electron
d. molecule
e. neutron
f. nucleus
g. periodic table
h. proton

H ___ 15. A positively charged particle inside an atom's nucleus.

B ___ 16. The number of protons in an atom of an element.

G ___ 17. A chart that shows the elements in order of increasing atomic number.

D ___ 18. The smallest particle of a compound that still has all the qualities of that compound.

C ___ 19. A particle with a negative electrical charge.

E 20. A particle that is found in the nucleus of an atom and has no electrical charge

F 21. The center of an atom, which contains most of the atom's mass.

A 22. The smallest particle of an element that still has the same chemical properties of the element.

Part D-Short Answer

23. A pillowcase full of Halloween candy is a(n) _____ mixture.

heterogeneous

24. When the same element has different atomic masses, it is called a(n)

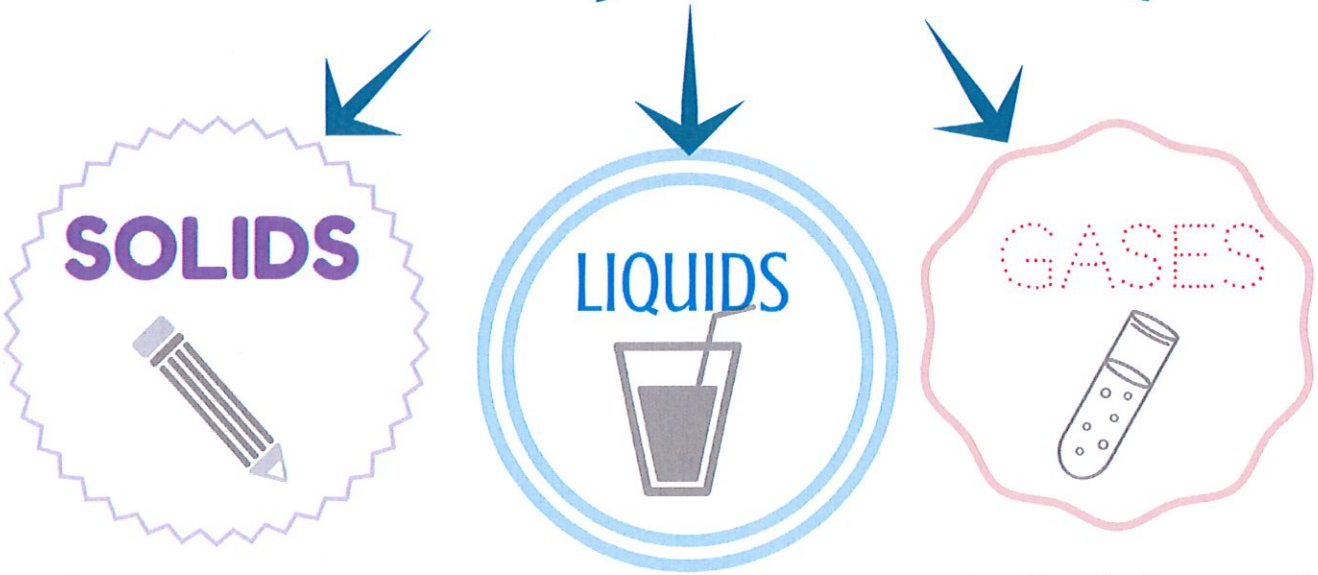
isotope

25. Water is a _____ that contains two hydrogen atoms and one oxygen atom.

molecule

26. Sugar or glucose ($C_6H_{12}O_6$) has: 6 carbon atoms, 12 hydrogen atoms, and 6 oxygen atoms.

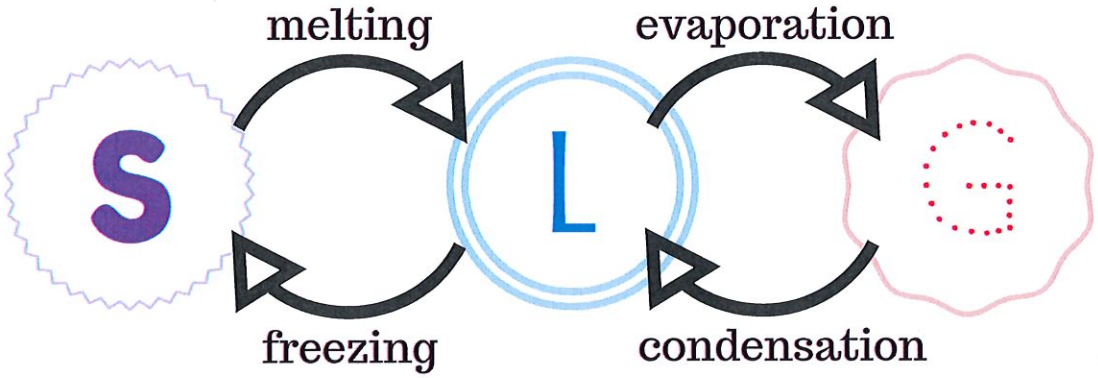
WHAT'S THE MATTER?



fixed shape and fixed volume

not a fixed shape and fixed volume

not a fixed shape and not a fixed volume



MASS, VOLUME, & DENSITY

MASS: The amount of matter in an object.
A scale is used to find the mass of different objects.
The unit of mass is grams (g).

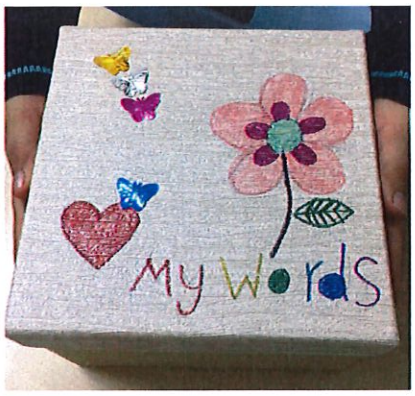
VOLUME: The amount of space something takes up.
The unit of volume is liters (l) or centimeters (cm).

$$V = \text{length} \times \text{width} \times \text{height}$$

DENSITY: The amount of mass in a given volume.

$$D = \frac{m \text{ (mass)}}{V \text{ (volume)}}$$

Lets calculate the density of the Learning Box below!



The mass is 800 g, length is 10 cm, height 3 cm and the width is 4 cm.

Physical vs Chemical

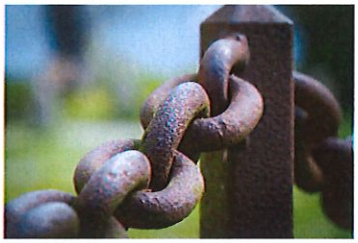
PHYSICAL PROPERTIES

Matter you can see without changing the identity of the substances that make it up.

- Changes shape
- Silver in color
- Density: 7.87
- Boiling point: 3,000• C
- Melting point: 1,536• C

CHEMICAL PROPERTIES

A substance can or cannot combine with or change into one or more new substances.



- Iron can rust
- Reacts with acid

PHYSICAL CHANGE

A change in the size, shape, form or matter that does not change the matters identity.

CAN reverse!

EXAMPLES

melting
boiling
mixing
dissolving

changing shape
changing state

CHEMICAL CHANGE

A change in which something new is made with different properties.

CANNOT reverse!

EXAMPLES

burning
rusting
rotten food
digestion

SIGNS

release a gas
color change
solid forms
heat is released

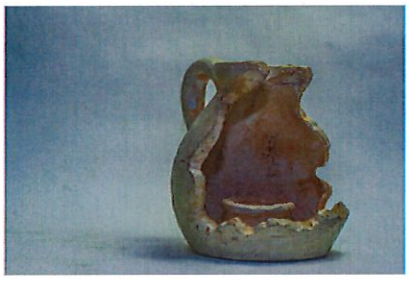
PRACTICE-MATTER

1. Aisha left her bicycle in the garden for a few weeks. The bicycles' color changed to an orange color. What is the type of change that happened? How did you know?

Chemical change. The bicycle began to rust because it reacted with acid

2. Determine whether each picture is a physical or chemical change.

physical

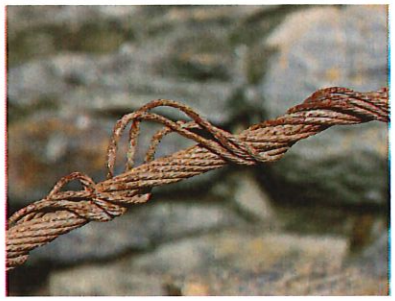


Physical

physical

physical

chemical



chemical

Revision Sheets

Chapter 4 - Matter and Its Properties

Answer the following questions.

Part A- True/False

Indicate whether the statement is true or false.

T 1. Ice, liquid water, and water vapor are the three states of water.

T 2. The odor of a substance is an example of a physical property.

F 3. Physical changes are difficult or impossible to reverse.

F 4. Sugar dissolved in tea, and sugar in a bowl, are not the same substance.

F 5. Weight is defined as the amount of space that matter takes up.

T 6. Copper is a metal and is a conductor of electricity.

T 7. A liquid will begin to solidify at its freezing point.

Part B- Multiple Choice

Identify the choice that best completes the statement or answers the question.

B 8. Which is <u>not</u> a physical change?

a. tearing paper
b. baking a cake
c. crushing ice
d. cutting an apple

B 9. Chopping a piece of wood and burning it demonstrates _____.

a. a chemical change followed by a physical change
b. a physical change followed by a chemical change
c. kinetic energy changes into potential
d. kinetic energy changes into chemical

A

10. The table shows the masses and volumes of three substances, which are named A, B, and C.

Substance	Mass (grams)	Volume (cubic centimeters)
A	2.4	2.0
B	3.1	2.0
C	2.0	2.0

Along with mass, what property must be different for all three substances?

a. density
b. volume
c. odor
d. color

C

11. In which state do particles spread apart quickly in all directions?

a. solid
b. liquid
c. gas
d. plasma

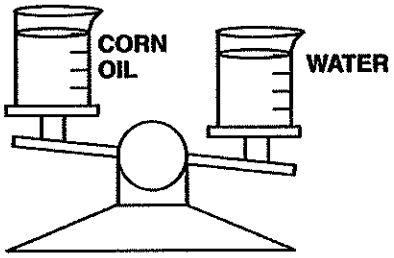
B

12. The temperature at which ice melts is called _____.

a. boiling point
b. melting point
c. 50 °C
d. evaporation

B

13. A beaker of corn oil was put on one side of a balance and the same size beaker of water was put on the other side of the balance. What can be concluded about corn oil and water from looking at the picture?



a. Corn oil and water have the same density.
b. Corn oil weighs less than water.
c. Corn oil weighs more than water.
d. Water and corn oil have the same weight.

C

14. Which is a chemical change?

a. change in shape
b. mixture
c. forming a new substance
d. boiling water

A 15. The change of a liquid to a gas as heat is applied is called _____.

a. evaporation
b. boiling
c. condensation
d. melting

C 16. The color, odor, and density of a substance are all _____.

a. imagined properties
b. material properties
c. physical properties
d. chemical properties

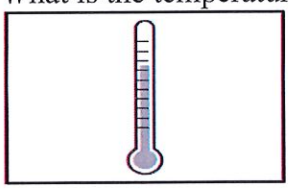
D 17. Which is <u>not</u> a physical property?

a. hardness
b. strength
c. density
d. flammability

A 18. Which state of matter has no definite shape and does not take up a definite amount of space?

a. gas
b. plasma
c. solid
d. liquid

D 19. What is the temperature at which a substance changes from a liquid to a gas?



a. melting point
b. dew point
c. condensation point
d. boiling point

Part C- Matching

Match each term with its correct description by writing the letter on the line.

a. gas
b. liquid
c. density
d. mass
e. physical property
f. solid
g. volume
h. weight

D 20. The amount of matter in an object.

H 21. The measurement of the pull of gravity on an object.

G 22. The amount of space that matter takes up.

F 23. Matter that has a definite shape and occupies a definite amount of space.

B 24. Matter that takes up a definite amount of space but has no definite shape

A 25. Matter that has no definite shape and does not take up a definite amount of space.

C 26. The measurement of how much mass fits within a certain volume.

E 27. A property that can be observed without changing the identity of a substance.

Part D- Short Answer

Answer each question using the space provided.

28. Density can be calculated using an object's _____ and _____.

mass and volume

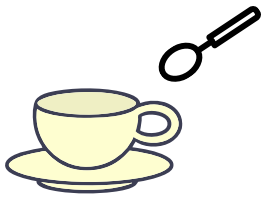
29. Describe three physical properties that can help to identify copper.

color
density
hardness

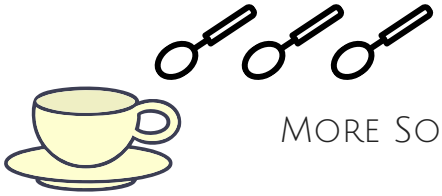
30. The evaporation of water is an example of a change in _____.

The state of matter . Physical change

solute + solvent is the SOLUTION



LESS SOLUTE → DILUTE SOLUTION



MORE SOLUTE → CONCENTRATED SOLUTION

To make a solute dissolve faster:

1. stir
2. higher temperature
3. crushing the solute

To dissolve more solute:

1. change pressure
2. change temperature

$$\text{Concentration} = \frac{\text{mass of solute (m)}}{\text{volume of solution (V)}}$$

EXAMPLE:

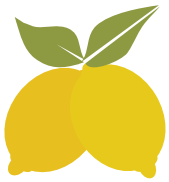
Fatima wants to calculate the concentration of salt in her soup. The can of soup is 0.8 L and contains 1.4 g of salt. What is the concentration of salt?

PRACTICE-SOLUTIONS

1. Fill in the blanks.

Water
250 mL

+



Lemon Juice
45 mL

+

Sugar
52 mL

=

Lemonade

Which ingredient is the most in the lemonade? water

Water is the solvent.

Lemon juice and sugar are the solute.

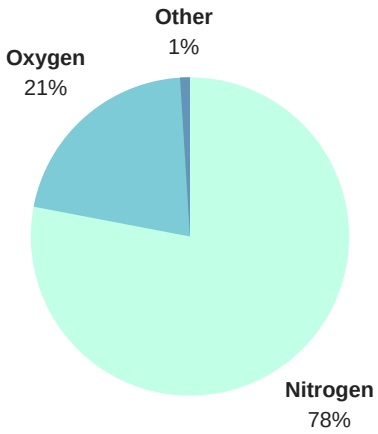
solvent + SOLUTE = solution

2. The graph shows all the parts in the air around us. Air is a solution. Fill in the blanks.

Air is a homogeneous mixture.

NItrogen is the solvent.

Oxygen and other are the solute.



3. Circle the picture in which the sugar would dissolve faster. Explain why in the space provided.

a.

HOT

OR

COLD

The warmer water allows for faster particle movement.

b.

OR

Smaller particles allow for more surface area to disolve the particles

ACIDS BASES

ACIDS

- produces hydronium ions
- sour
- damages skin and eyes
- reacts with metal
- hydronium ions can conduct electricity
- milk, lemon juice, coffee

BASES

- produces hydroxide ions
- bitter
- damages skin and eyes
- reacts with metal
- hydroxide ions can conduct electricity
- shampoo, window cleaner

The pH Scale

ACIDIC Neutral BASIC

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14







EXAMPLE: State whether it is an acid or a base.

1. Ammonia pH=11.9 ___base_____
2. Vinegar pH= 2.9 ___acid_____
3. Orange juice which contains hydronium ___acid_____
4. Baking soda which has a bitter taste ___base_____

PRACTICE-ACIDS & BASES

1. Circle the correct answer.

a) If the hydronium ions increase the pH is low / high.

b) Litmus / Meter paper is used to test whether a solution is acid or base.

c) If a solution has a pH of 8.5 it has more Hydronium / hydroxide ions.

d) If the pH falls between 0 and 7 it is a(n) acid / base.

2. List the following from the most acidic to least acidic.

- milk pH= 6.4
- ammonia pH= 11.9
- coffee pH= 5
- battery acid pH= 1
- blood pH= 7.4
- sea water pH= 7.5
- stomach acid pH= 2

battery acid | stomach acid | coffee | milk | blood | sea water | ammonia

3. Water is neutral and has a pH of 7. Does it contain more hydronium ion or hydroxide ion? Explain your answer.

Water contains an equal amount of hydronium ions and hydroxide ions

Chapter 5 – Solubility and Acid/Base Solutions

Part A – Modified True/False

*Indicate whether the statement is true or false. Correct the false statement by changing the term in **bold** using the space provided.*

F 1. A solution is a **heterogeneous** mixture. homogeneous

T 2. Sugar dissolved in tea, and sugar in a bowl, **are not** the same substance. _____

T 3. Steel is an example of **alloy**. _____

F 4. You can increase the solubility of a substance by **cooling** it. heating

Part B - Multiple Choice

Identify the choice that best completes the statement or answers the question.

D 5. When someone dissolves sugar in hot water, the sugar is the ____ and the hot water is the _____.

a. solvent, solution
b. solute, solution
c. solvent, solute
d. solute, solvent

B 6. The substance being dissolved to form a solution is the ____.

a. solvent
b. solute
c. precipitate
d. mixture

C 7. The atmosphere of Earth is composed of nitrogen, oxygen, and carbon dioxide. This is an example of a ____ solution.

a. liquid-liquid
b. gas-liquid
c. gas-gas
d. solid-liquid

A 8. Carbon dioxide in water is an example of _____.

a. gas - liquid
c. liquid - solid

b. liquid - liquid
d. none of the above

B 9. Water is an example of a _____.

a. solute
b. solvent
c. mixture
d. alloy

D 10. Brass is a mixture of _____.

a. steel and iron
b. salt and water
c. gold and silver
d. copper and zinc

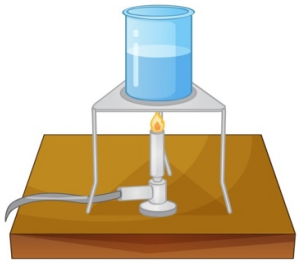
A 11. Lemonade powder mixed with water is an example of _____.

a. homogeneous mixture
b. suspension
c. colloid
d. molecule

D 12. Solutions can be _____.

a. diluted
b. saturated
c. concentrated
d. all of the above

B 13. Heating a solution will _____ the solubility of a substance.



a. decrease
b. increase
c. reduce
d. not change

A 14. Fatima added two spoonfuls of lemonade powder to a cup of water. The solution is _____.

a. saturated
b. diluted
c. concentrated
d. Toxic

D 15. Which of the following solutions is the most acidic?

a. 8
b. 7
c. 5
d. 2

Part C – Completion

Complete each statement using the term that best completes each sentence.

16. A solution is _____ when no more solute is being dissolved. saturated
17. Heating and _____ can help a solute dissolve more quickly. Stirring
18. An example of a solute is ___salt___.
19. An example of a solution is ___tea____.
20. If you put few grains of salt in a cup of water, the solution is salt water.
21. As the concentration of hydronium ions increases, pH decreases.
22. A solution with pH above 7, is a(n) ____neutral_____ solution.

Part D – Matching

Match each term with the correct description below.

a. alloy
b. solution
c. solubility
d. solute
e. solvent

C 23. The maximum amount of a substance dissolved in another.

E 24. A substance that the solute dissolves in.

B 25. A homogeneous mixture of one substance dissolved in another

A 26. A mixture of one or more metals with other solids.

D 27. A substance that dissolves.

Part E - Short Answer

Read each question below and write your answer on the space provided.

28. Salt water is a solution that can be separated. Is this statement true or false? Explain.

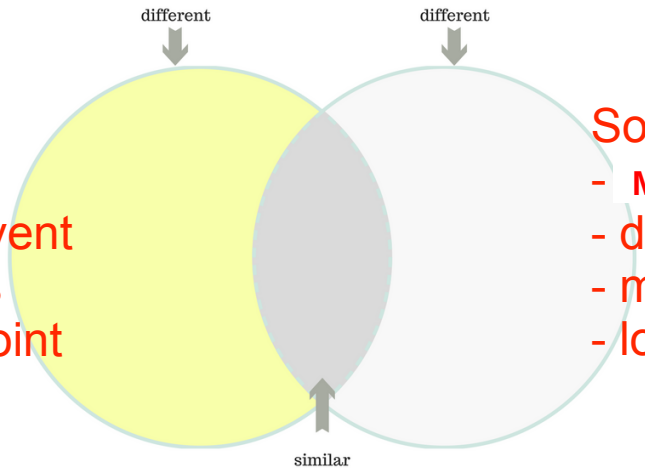
True. A solution is made up of a solvent (water) and a solute (salt) evenly mixed

29. A sugar solution shown in the picture below appears to be saturated. What can you do to increase its solubility?

You can heat the solution and **Stir** the sugar particles to increase the solubility

30. Give one example on each of the following:
    - Liquid - Liquid solution **alcohol in water**
    - Solid - Solid solution brass
    - Gas - Gas solution air

31. How is a solute different from a solvent?



Solute:
- **Less than solvent**
- dissolves in solvent
- solid, liquid, gas
- higher boiling point

Solvent:
- **More than solute**
- dissolves solute
- mostly liquids
- lower boiling point

- creates a solution when combined
- forms mixtures

32. What is the concentration of 5 g of sugar in 0.2 L of solution?

$$\text{concentration} = \frac{\text{mass of solute (m)}}{\text{volume of solution (V)}} \qquad \frac{5g}{0.2L} = 25g/L$$

33. A salt solution has a concentration of 200 g/L. How many grams of salt are there in 2 L of this solution?

$$\text{concentration} = \frac{\text{mass of solute (m)}}{\text{volume of solution (V)}} \qquad 200g/L = \frac{x}{2L} \qquad x = 400g$$

34. List two methods that can be used to measure the pH of a solution.

pH indicators
pH test strips
pH meter

35. A salt solution has a concentration of 200 g/L. How many grams of salt are there in 2 L of this solution?

36. How much more acidic is a solution with a pH of 6 than a solution with pH of 2? $\frac{PH\ -2}{PH-6} = 10\text{-}4 = 10000$

Each whole pH is 10x's more acidic than the next higher pH value.

So….
pH2 ⟶ pH 3= 10
pH3 ⟶ pH 4= 100
pH4 ⟶ pH 5= 1000
pH5 ⟶ pH 6= 10000

37. The pH of a solution is inversely related to the concentration of hydronium ions in a solution. Explain what does this mean using your own words.

As the pH increases, the amount of hydronium ions increase. There are more hydronium ions in an acid and less in a base. In substances with a neutral pH (7) the hydronium and hydroxide ions are equal.