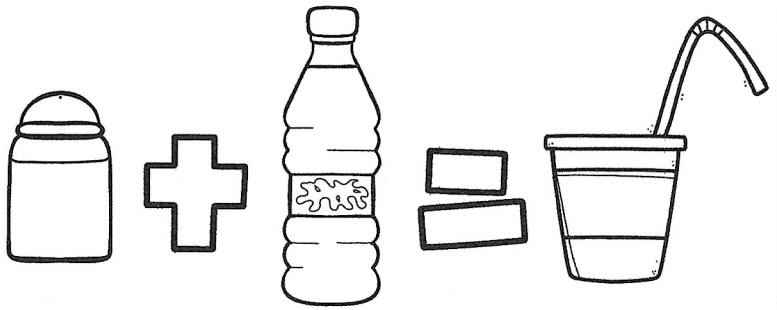
solution

Where one **SUBSTANCE** is **DISSOLVED** into another

EXAMPLE:



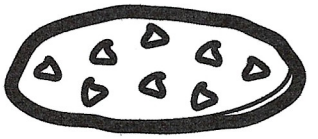
salt + water = salt water

A **SOLUTION** is the **SAME THROUGHOUT**

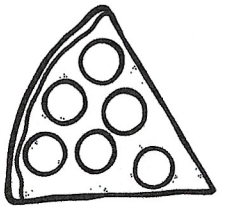
mixture

TWO or **MORE** **SUBSTANCES** are **COMBINED**

EXAMPLES:



Chocolate Chip Cookie



Pizza

Vegetable Soup

the **PARTS** can be easily **SEPARATED**

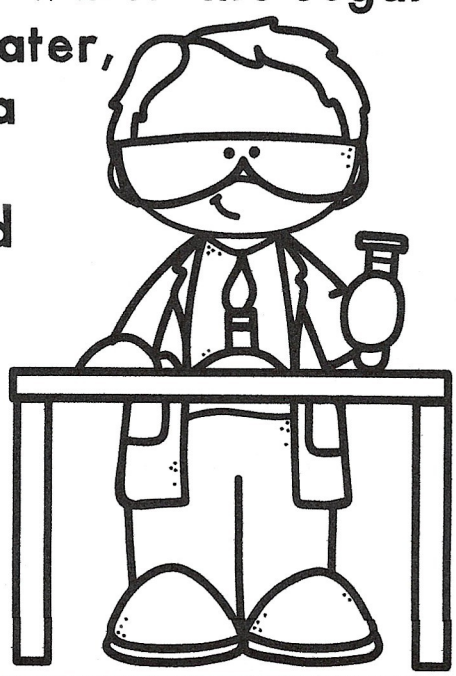
WHAT is a SOLUTION?

Have you ever made a pack of Kool-aid to drink? Think about what is needed to make Kool-aid: water, sugar, and a Kool-aid packet of flavor and color. When the ingredients are stirred together, all the different parts join together to make a sweet tasting drink. The Kool-aid is ready! Kool-aid is an example of a solution.

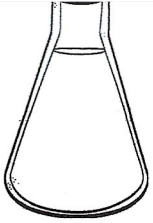
Two or more objects that are put together that cannot be easily separated is called a solution. A solution is made by dissolving one or more substances in a liquid, like water. When the parts of a solution are mixed together, a physical change is made. The solubility, or ability to be dissolved, is an important property of materials.

Solutions have two parts: solutes and solvents. The liquid that dissolves something is called a solvent. Water is a common solvent in solutions. The solute is the substance being dissolved. Sugar in the finished Kool-aid is a solute.

Not all substances will dissolve in water like sugar and drink mix. Sand, when mixed with water, does not dissolve into the water to form a solution. The sand will float around the water and then settle in the bottom. Sand is insoluble in water, because it does not join the water particles. A mixture is formed, but not a solution. A mixture is when two or more substances are combined but each substance stays the same.



Name _____



SOLUTES and SOLVENTS

Solutions have two parts: solutes and solvents. The liquid that dissolves something is called the solvent. The solute is the substance being dissolved.

Directions: Read each solution. Decide what part of the solution is the solute and what part is the solvent.

SOLUTION: LEMONADE

made with lemons, sugar, and water

Solute:	Solvent:

SOLUTION: SEA WATER

made with salt and water

Solute:	Solvent:

SOLUTION: SODA

made from carbonated water, corn syrup, phosphorous acid, and caffeine

Solute:	Solvent:

Is it SOLUBLE or INSOLUBLE?

A Chemistry Experiment

Materials Needed:

- 6 clear cups with water
- Measuring spoon
- sand
- sugar
- flour
- vinegar
- salt
- oil

Guiding Question: Which substances are soluble or insoluble in water?

Hypothesis: Which substances do you think are soluble or insoluble when added to water?

Make your predictions below by choosing whether each substance will be soluble or insoluble when added to water. Check each box to make your predictions.

Substance	Soluble	Insoluble
Sand		
Sugar		
Oil		
Flour		
Vinegar		
salt		

Experiment Steps:

1. Take 2 tablespoons of sand and drop it into one of the cups of water.
2. Stir.
3. Observe what happened.
4. Is the sand soluble or insoluble in water? Record your findings in the chart below.
5. Follow the same steps above with each of the substances Make sure you start each step with a new cup of water.

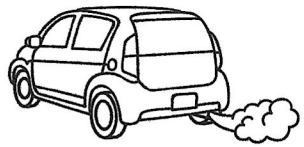
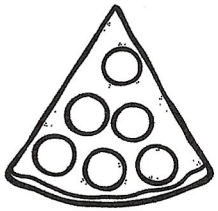
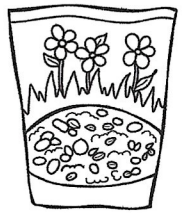
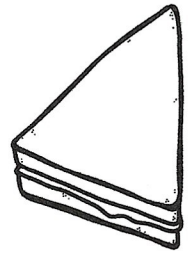
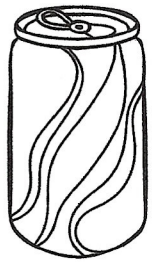
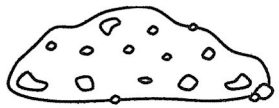
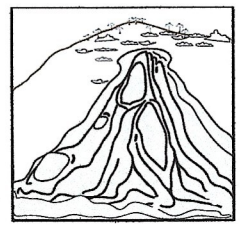
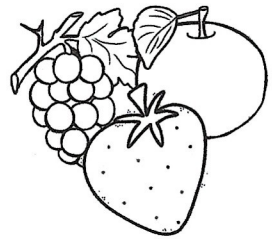
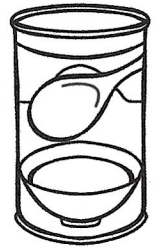
Record your findings:

Substance	Soluble	Insoluble	Observations (What did you notice?)
Sand			
Sugar			
Oil			
Flour			
Vinegar			
salt			

Mixture or Solution?

Name _____

Directions: If the picture shows a mixture, write the word mixture on the line. If the picture shows a solution, write the word solution on the line.

hand soap  _____	gasoline  _____	orange juice  _____	shampoo  _____	air  _____	hot chocolate  _____
pizza  _____	lemonade  _____	trail mix  _____	chocolate chip cookie  _____	sandwich  _____	ocean water  _____
soda  _____	dirt  _____	laundry detergent  _____	mud  _____	fruit salad  _____	soup  _____

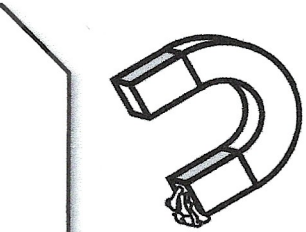
Name: Answer key

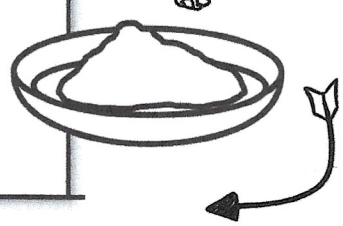
MIXTURES AND SOLUTIONS Word Search

E	O	S	E	E	D	S	P	R	E	S	M	A	G	N	E	T	S
V	H	C	R	N	E	S	U	A	S	O	R	C	K	E	C	U	E
A	T	R	D	I	S	S	O	L	V	E	H	L	E	E	A	S	C
P	G	M	H	C	L	E	R	L	O	E	I	X	E	L	R	O	O
O	S	L	D	L	G	G	C	S	U	N	A	E	D	R	G	L	N
R	P	E	S	N	N	O	C	E	M	B	F	J	S	E	O	U	S
A	L	G	A	O	C	L	H	E	X	E	I	U	T	F	V	T	T
T	A	H	C	M	I	X	T	U	R	E	R	L	S	I	E	I	I
E	C	S	C	D	L	R	V	R	T	C	M	I	I	L	R	O	T
M	E	L	H	A	O	T	U	A	P	L	D	C	O	T	N	N	U
E	L	A	I	B	N	O	L	U	S	M	L	I	M	E	Y	E	T
D	E	T	M	E	F	T	L	C	L	S	A	A	N	R	E	B	I
I	T	I	V	S	R	U	E	E	O	A	A	T	O	A	N	L	O
V	S	L	A	E	M	B	N	R	H	E	T	E	T	T	T	O	N
T	O	E	J	U	S	T	I	N	S	O	L	U	T	E	S	O	S
S	P	T	E	O	S	D	R	L	E	E	N	H	R	S	R	D	R
P	C	A	O	I	L	L	A	R	L	L	S	G	I	Y	U	D	E

Word Bank

MIXTURE	SOLUBILITY	FILTER
SOLUTION	DISSOLVE	FUNNEL
SOLVENT	EVAPORATE	MAGNET
SOLUTE	MATTER	CHANGE



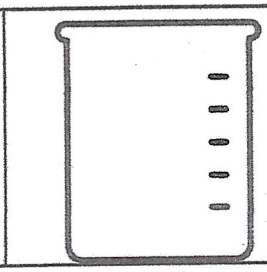
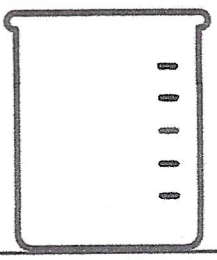


Name: _____

MIXTURES AND SOLUTIONS

1. What is the difference between a pure substance and a mixture?

2. In the left box, explain the difference between a homogenous and heterogenous mixture then draw a diagram in the beaker to illustrate it.

Heterogenous	Homogenous
	

3. Identify which mixtures are homogenous or heterogenous.

_____ ketchup

_____ fruit salad

_____ coffee

_____ chocolate chip cookie dough

_____ trail mix

_____ vanilla ice cream

4. You have been given a mixture of salt and water. The salt dissolves in the water so this mixture is a _____. The salt is the _____ and the water is the _____.

How could you tell if this solution is saturated?

5. You know that 36 grams of salt were dissolved in 100 mL of water. What is the concentration of the solution?

Name: _____

SEPARATING MIXTURES - LAB

In this activity, you will use different methods to separate mixtures.

Mixture 1: Sand and Water Method: Filtration

Is the mixture heterogenous or homogenous: _____

1. Set the funnel over the empty beaker and line it with the filter paper.
2. Slowly pour the solution into the funnel and wait for it to filter the mixture.

Draw how you separated the mixture:	Describe the results:

Mixture 2: Beads, Sand, Iron Filings Method: Mechanical Separation

Is the mixture heterogenous or homogenous: _____

1. Pick the beads out of the sand
2. Use the magnet to attract the iron filings.

Draw how you separated the mixture:	Describe the results:

Name: _____

Mixture 3: Salt and Water

Method: Evaporation

Is the mixture heterogenous or homogenous: _____

1. Pour your liquid into an evaporating dish.
2. Place the dish in a warm area and leave overnight.

Draw how you separated the mixture:	Describe the results:

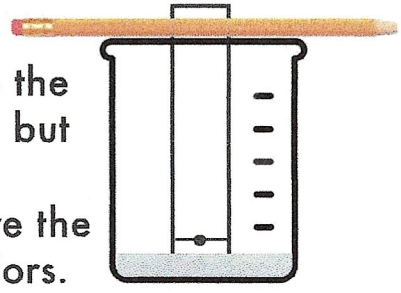
Mixture 4: Ink Pigments

Method: Paper Chromatography

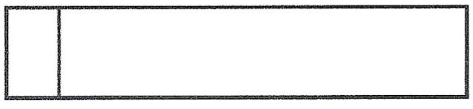
Is the mixture heterogenous or homogenous: _____

1. Use a PENCIL to draw a line across the short side of the filter paper about 1.5 cm from the end.
2. Use the marker to make a small circle of ink at the bottom of your paper.

The circle should this size → ●



3. Tape your filter paper to your pencil and suspend it into the beaker so the water touches the bottom of the filter paper, but does not cover the ink.
4. The water will travel up the filter paper and will dissolve the pigments in the ink and they will separate into different colors.

Draw the results:	Describe the results:
	

List the steps you would take to separate a mixture of salt and pepper.

_____

_____

_____

A Little Quiz on Lesson 5 Name _____

A 1. What is a **mixture**?

a. Two or more substances that combine.
b. A chemical reaction that explodes.
c. Something that tastes good.

C 2. Which of these is a **homogenous** mixture?

a. Cereal and milk
b. Salad
c. Salt water

A 3. Which of these is a **heterogeneous** mixture?

a. Cereal and milk
b. Cocoa
c. Salt water

A 4. In a glass of salt water, which is the **solute**?

a. Salt
b. Water
c. Salt water

B 5. In a glass of salt water, which is the **solvent**?

a. Salt
b. Water
c. Salt water

C 6. In a glass of salt water, which is the **solution**?

a. Salt
b. Water
c. Salt water

B 7. Water is a _____ molecule.

a. Slimy
b. Polar
c. Huge

C 8. Water and _____ together can clean dirty hands.

a. Salt
b. Sugar
c. Soap

B 9. When one substance combined with another substance to make a solution, it has _____

a. Mixed
b. Dissolved
c. Fragmented

C 10. Since salt can dissolve in water, it is

a. Liquid
b. Solid
c. Soluble

Little Chemistry Quiz #2 **Name** _____

A 1. What is an atom?

a. a very tiny particle of matter.
b. Something that makes protons
c. Something that makes neutrons

C 2. What are atoms made of?

a. Protons, matter, electrons
b. Neutrons, charges, elements
c. Protons, neutrons and electrons.

B 3. Which particle has a positive charge?

a. Electron
b. Proton
c. Neutron

A 4. Which particle has a negative charge?

a. Electron
b. Proton
c. Neutron

C 5. How do acids taste?

a. Sweet
b. Bitter
c. Sour

A 6. Which is a weak acid?

a. Lemon juice
b. Battery acid
c. Hydrochloric acid

B 7. Which is the opposite of an acid?

a. Protons
b. A base
c. Lemon juice

A 8. Which is an endothermic reaction?

a. Cooking an egg
b. Burning a candle
c. 2 + 2

A 9. Which is an exothermic reaction?

a. When something gives off heat
b. When something freezes
c. 4 x 2

A 10. What is true about elements?

a. They all have atoms with the same number of protons
b. They all have atoms which glow in the dark
c. They don't contain electrons

Carbon is an element whose atoms have 6 protons, 6 electrons, and 6 neutrons. Draw an atom of carbon.