Name: _____

Mixtures and Solutions

PowerPoint Review

1. What is a mixture?

2. What happens to a handful of sand when you put them in a cup of water?

3. _____, _____, and _____ are all examples of mixtures.

4. A solution is made when you combine two or more substances and one substance is completely _____ in the other.

5 What happens when you mix sugar and water together?

6. _____, _____, and _____ are all examples of solutions.

7. What does the word soluble mean?

8. When a solid is dissolved in a liquid, we call the liquid a _____ and the solid a _____.

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9. How can solutions be separated?

10. Evaporation is when a _____ is changed to a _____.

11. What are examples of things you can separate using a funnel?

12. What are examples of things you can separate using a filter?

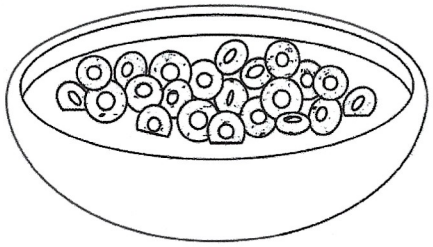
13. What are examples of things you can separate using a magnet?

14. What is a physical change?

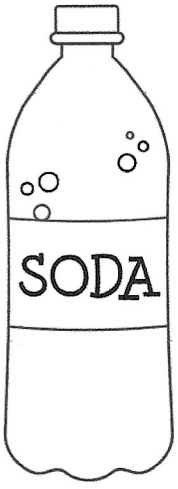
15. What is matter?

16. What is one example of a physical change?

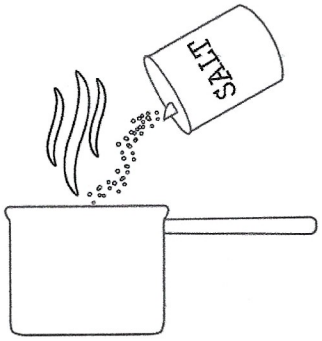
Mixtures and Solutions



Have you ever poured cereal in a bowl of milk? What happens to the cereal when you put it in milk? The cereal basically floats around in the milk, right? Cereal and milk can be easily separated. This means that it is a **mixture**. A mixture happens when you combine two or more substances, but they do not completely mix. Each substance keeps its physical properties. They do not have a chemical reaction, such as something burning or rusting. Other examples of mixtures include a salad, sand and water, oil and water, and trail mix (a mixture of peanuts, raisons, and chocolate candy).



A **solution** is a special type of mixture formed when you mix two or more substances and one substance is completely dissolved in the other. To **dissolve** means the substance gets smaller and smaller until it is invisible. For example, you can't see the salt in ocean water because the salt is dissolved. Carbonated beverages, such as soda and energy drinks, are solutions because they are made by dissolving carbon dioxide gas into liquid at high pressure. Other examples of solutions include, dish soap, hot chocolate, and lemonade.



When something is able to dissolve into another substance, it is because it has a physical property called **solubility**. For example, salt is considered soluble. If you put some salt in a bowl of soup and start stirring, the salt will get smaller and smaller until it is invisible, meaning that it dissolved. When a solid is dissolved in a liquid, we call the solid a **solute** and the liquid a **solvent**. Therefore, the salt is the solute and the soup is the solvent.

Mixtures and Solutions
VOCABULARY

Mixture: a combination of two or more substances that keep their physical properties and can be easily separated

Solution: a special type of mixture where one substance is dissolved into another substance

Solubility: the ability of something to dissolve in a liquid

Solute: the substance that dissolves

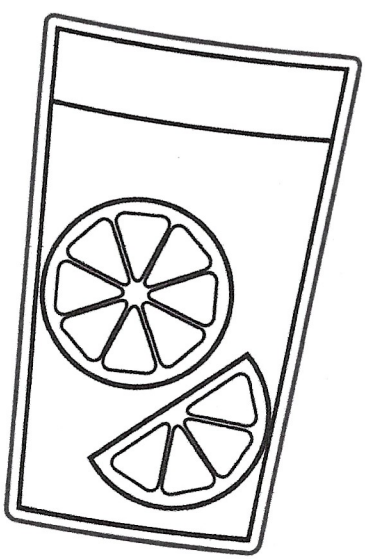
Solvent: the liquid in which a solute is dissolved

Dissolve: the substance gets smaller and smaller until it is invisible

Physical Change: a change in the shape or appearance of an object- no new substances are formed

Evaporation: the physical change of matter from liquid to gas

Matter: anything that takes up space



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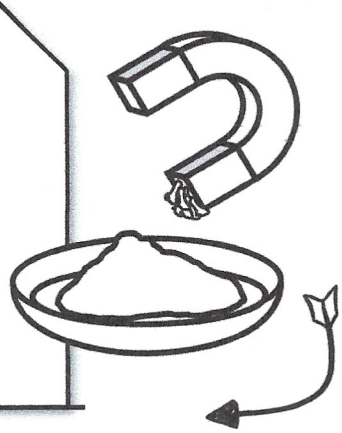
MIXTURES AND SOLUTIONS

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



Solubility Science: How Much Will Dissolve?

When you add a spoonful of sugar to your hot tea, where does it go? The sugar "disappears" because it has dissolved in a chemical process called *dissolution*. There is a limit, though, to how much sugar (or any other solute) can be completely dissolved into a solvent. This experiment will help you understand why.

Materials:

- Distilled water
- Beaker
- Clear, plastic cups
- Spoons
- 1 teaspoon measuring spoon
- Epsom salt
- Table salt
- Table sugar
- Baking soda
- Digital scale
- Marker
- Paper
- Pen
- Thermometer

Procedure

1. You have 8 plastic cups. Label two of them "Epsom salt", two of them "table salt", two of them "sugar" and two of them "baking soda."
2. Into one baking soda cup, measure 20 grams of baking soda.
3. Into one table salt cup, measure 50 grams of table salt.
4. Into one Epsom salt cup, measure 150 grams of Epsom salt.
5. Into one sugar cup, measure 250 grams of sugar.
6. Label the cups, below, with their contents and masses:

7. Add 100 mL of distilled water to each of the remaining cups. Take the mass of each cup and record it below:

8. Now, take both cups labeled "baking soda." With the teaspoon, carefully add *exactly* one teaspoon of baking soda from the first cup into the cup with water.
9. Stir until all the baking soda has dissolved.
10. Continue to add baking soda to the water cup until the baking soda no longer dissolves.

11. Do the same with the Epsom salt, sugar, and table salt. Stop adding a solute (powder) when no more of it will dissolve into the solvent (water).
12. Take the mass of each solution. Record your information into the table below.

Solute (powder)	Initial mass of Water	Mass of saturated solution	Mass of solute powder added

1. Describe the appearance of each cup when you could no longer dissolve a solute into the solution.

2. Which solute (powder) was the most soluble in distilled water?

3. Which solute (powder) was the least soluble in distilled water?

4. There is a way to make more solute dissolve into solution. What might you do?

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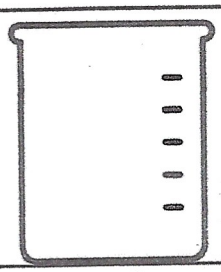
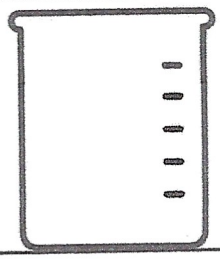
MIXTURES AND SOLUTIONS

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?

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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.

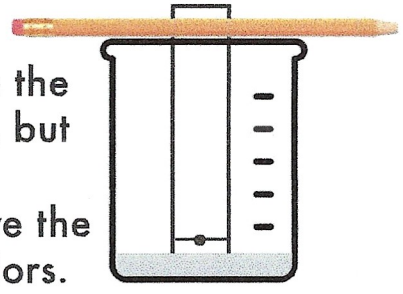
Draw how you separated the mixture:	Describe the results:

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.

_____

_____

_____

Name: _____

Mixtures and Solutions Vocab Match

Match each word to its definition. Write the correct letter in the space provided.

1. Mixture _____
2. Solution _____
3. Solubility _____
4. Solvent _____
5. Solute _____
6. Dissolve _____
7. Physical Change _____
8. Evaporation _____
9. Matter _____

a the substance that dissolves

b the physical change of matter from liquid to gas

c a special type of mixture where one substance is dissolved into another substance

d a change in the shape or appearance of an object - no new substances are formed

e anything that takes up space

f a combination of two or more substances that keep their physical properties and can be easily separated

g the liquid in which a solute is dissolved

h the substance gets smaller and smaller until it is invisible

i the ability of something to dissolve in a liquid

A Little Quiz on Lesson 5 Name _____

_____1. What is a **mixture**?

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

_____2. Which of these is a **homogenous** mixture?

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

_____3. Which of these is a **heterogeneous** mixture?

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

_____4. In a glass of salt water, which is the **solute**?

a. Salt
b. Water
c. Salt water

_____5. In a glass of salt water, which is the **solvent**?

a. Salt
b. Water
c. Salt water

_____6. In a glass of salt water, which is the **solution**?

a. Salt
b. Water
c. Salt water

_____7. Water is a _____ molecule.

a. Slimy
b. Polar
c. Huge

_____8. Water and _____ together can clean dirty hands.

a. Salt
b. Sugar
c. Soap

_____9. When one substance combined with another substance to make a solution, it has _____

a. Mixed
b. Dissolved
c. Fragmented

_____10. Since salt can dissolve in water, it is

a. Liquid
b. Solid
c. Soluble

Little Chemistry Quiz #2 **Name** _____

_____1. What is an atom?

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

_____2. What are atoms made of?

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

_____3. Which particle has a positive charge?

a. Electron
b. Proton
c. Neutron

_____4. Which particle has a negative charge?

a. Electron
b. Proton
c. Neutron

_____5. How do acids taste?

a. Sweet
b. Bitter
c. Sour

_____6. Which is a weak acid?

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

_____7. Which is the opposite of an acid?

a. Protons
b. A base
c. Lemon juice

_____8. Which is an endothermic reaction?

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

_____9. Which is an exothermic reaction?

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

_____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.