Matter Notes

OB: We will determine what matter is, what are the phases of matter, and describe various physical properties of matter. We'll also cover lots of vocabulary that you MUST MASTER ASAP

All matter is in one of these 4 "states" or phases:

A. _____ B. _____ C._____ D. _____

The word aqueous means: _____

Matter can be PURE or MIXED. Pure matter includes the _____

(from the _____ table) and all of the millions of _____

Mixtures are _____ _____ of pure _____.

What is a physical property of matter? Qualities that can be…

_____ and are _____

Some examples of physical properties include…

Physical Changes are also called _____ changes.

When matter changes phases (6 different ways, know all of these) we give them these specific names.

Solid → liquid is called _____ Liquid → solid is called _____

Gas → liquid is called _____ Liquid → gas is called _____

Solid → gas is called _____ Gas → solid is called _____

Let's watch a demonstration now, and then, fill in the few blanks on the next page.

Demonstration of the sublimation of Iodine, at the vent hood (for safety)

What goes into the evaporating dish (be specific). _____

What comes out? _____

This process is called _____, and it's a _____ change.

The symbols for this would be:

$$I_{2(S)} + \text{heat} \rightarrow I_{2(S)}$$

Iodine solid is heated into iodine gas, which is sublimation. The reverse of this would be deposition.

What is a mixture?

Some mixtures are the same throughout. They are called _____

Some mixtures are NOT "mixed perfectly" throughout. They're called _____.

Examples of mixtures that are

Solids:

Liquids:

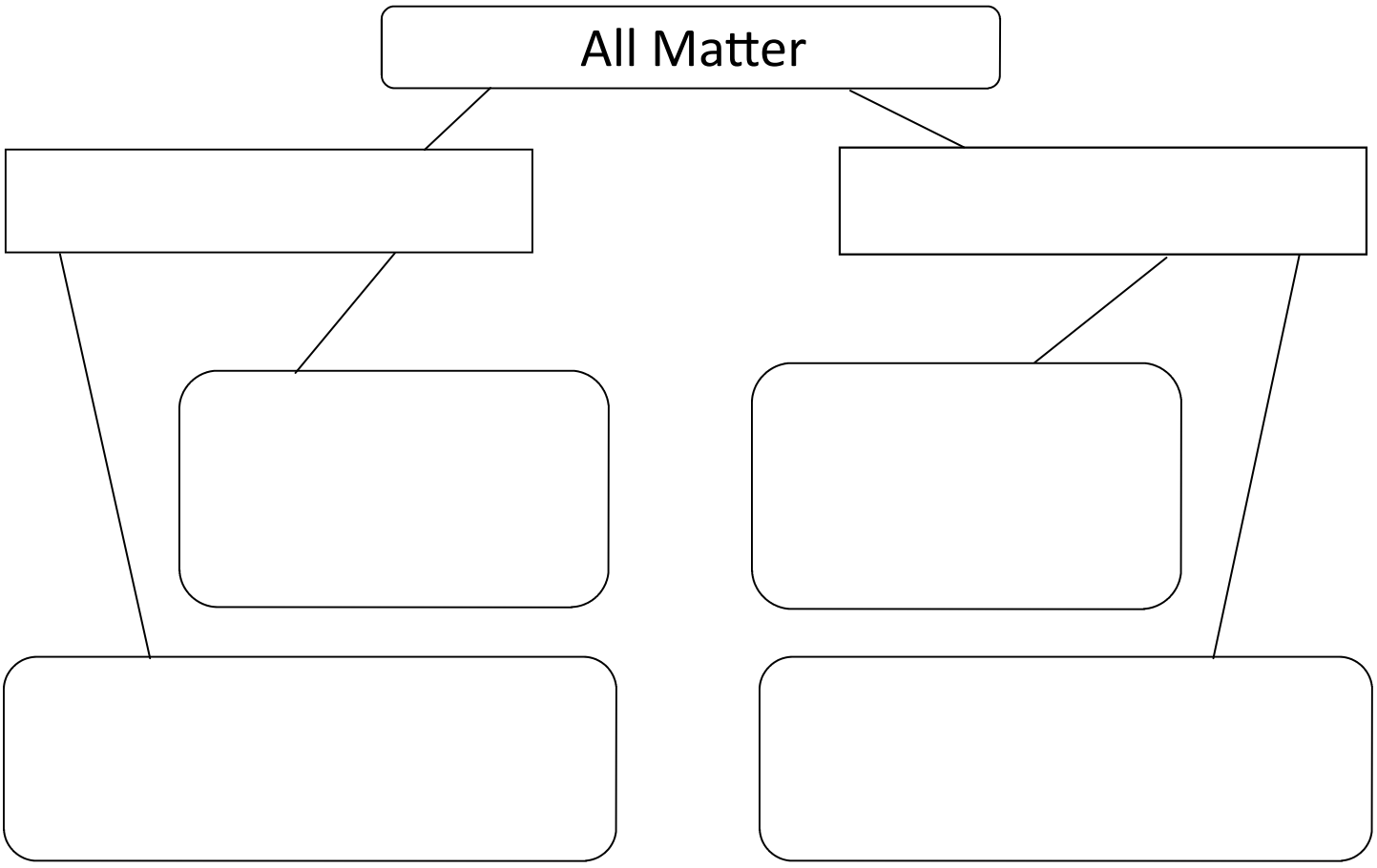
Gases:

Matter Class #2 OB: Compounds + Elements, the Law of Conservation of Matter

Elements are

Compounds are

Mixtures are



Print the LAW OF CONSERVATION OF MATTER in this box. Memorize it. The whole thing.

What is another way to say physical change? _____

Write the word equation for this reaction on this line:

_____

The sodium and the chlorine are called the _____ because they _____ and will form into the sodium chloride.

The sodium chloride is the _____.
Sometimes there is one product, sometimes there are more. Every chemical reaction is different.

The mass of the sodium *plus* the chlorine will _____ the mass of the sodium chloride that forms because this reaction

follows the _____ of _____ of _____

Practice. In complete reactions,

46 g sodium + 70 g chlorine → _____ grams of sodium chloride

8 g hydrogen + 64 g oxygen → _____ g water

4 g hydrogen + _____ g oxygen → 36 grams water

____ g hydrogen + 28 g nitrogen → 34 g ammonia (NH_3)

223 g Iron + 96 grams oxygen → _____ g rust (Fe_2O_3)

Matter Class #3

OB: Learning to count atoms in chemical formulas, Principles of separating mixtures, and the general indicators that a chemical reaction has probably occured

First we count. How many atoms, what atoms are in each of these compounds?

H_2O _____ NaCl _____ CO_2 _____

H_3PO_4 _____ H_2SO_4 _____ $C_6H_{12}O_6$ _____

These are harder, how many atoms of each kind, how many all together in each compound?

Fe_2O_3 _____ H_3PO_4 _____ $KHCO_3$ _____

$Li_2C_2O_4$ _____ $Ca(OH)_2$ _____ $Al(OH)_3$ _____

$Al_2(Cr_2O_7)_3$ _____ $(NH_4)_2SO_3$ _____

What ever is inside of the parenthesis gets multiplied by the subscript following it.
The number only affect the atoms right before the number.

Mixtures are just _____

Compounds are _____

With mixtures, NO NEW _____ and NO NEW _____ form.

Since mixtures are not chemically combined together, they are just physically blended, to take them apart, to separate them we use _____ means.

<u>To separate mixtures we need to take advantage of differences in their physical properties</u>
This is an important sentence to MEMORIZE.

Salty water is a solution, a _____ mixture. To separate them we need to take advantage of the fact that the salt and the water have _____ _____ points.

That process is called _____.

We need to use a tool called the _____ _____

A mixture between iron + sulfur powder (or iron + dirt) could be separated using a _____

That's because the sand and the iron have this difference:

Other ways to separate mixtures could be by taking advantage of differences in:

A chemical reaction is when 2 or more substances are combined in a chemical reaction, and we get

NEW PURE SUBSTANCES form, and they have _____properties than the reactants had.

Some chemical reactions are OBVIOUS, but we will use this TOPIC-B acronym to help us look for the 6 indicators that a chemical reaction PROBABLY occurred.

The letters of TOPIC-B stand for the six indicators that a chemical reaction has probably occurred. They are:

T -

O -

P -

I -

C -

B -

Matter Class #4

Objective: Learning to draw Particle Diagrams for solids, liquids, gases, atoms, molecules, diatomic molecules, compounds, and mixtures.

A PARTICLE DIAGRAM:

There are 7 vocabulary words here, only the LAST ONE should be new.

SOLID – LIQUID – GAS - ATOM – COMPOUND – MIXTURE – DIATOMIC ELEMENTS

Diatomic Elements are:

There are 7 diatomic elements, they are known as the _____ TWINS.

From the smart board, draw PARTICLE DIAGRAMS for

Solids	Liquids	Gases

From the smart board, draw examples of PARTICLE DIAGRAMS for

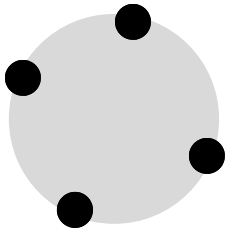
Atoms	Diatomic elements	Molecules

Quiz (no grade) now. On the next page are 8 particle diagrams, they have multiple answers. Which are which? Circle all the correct or possible answers. Watch smart board for the real answers.

The ratio of particles to particles here is _____

It could be… (circle all that work)

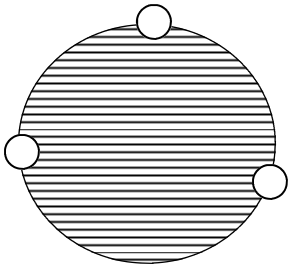
1. H_2O
2. PCl_3
3. NH_3
4. SO_3
5. CH_4



The ratio of particles to particles here is _____

It could be… (circle all that work)

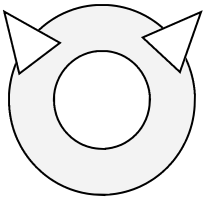
1. H_2O
2. PCl_3
3. NH_3
4. SO_3
5. CH_4



The ratio of particles to particles here is _____

It could be… (circle all that work)

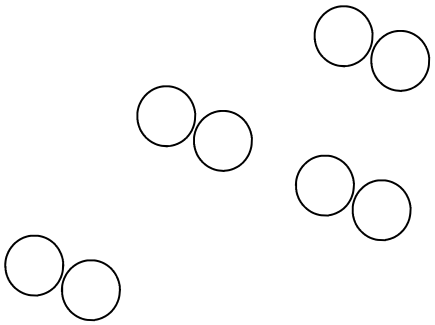
1. H_2O
2. PCl_3
3. CO_2
4. SiO_2
5. CH_4



The ratio of particles to particles here is _____

It could be… (circle all that work)

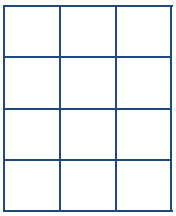
1. H_2
2. Cl_2
3. NH_3
4. SO_2
5. NaCl



The ratio of particles to particles here is _____

It could be… (circle all that work)

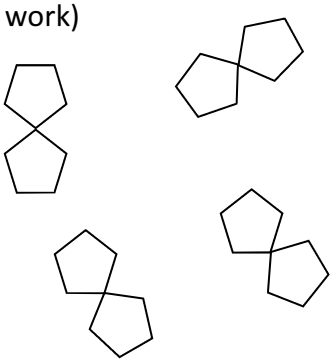
1. $H_2O_{(L)}$
2. $H_2O_{(L)}$
3. $H_2O_{(S)}$
4. $Cu_{(S)}$
5. $CO_{2(S)}$



The ratio of particles to particles here is _____

It could be… (circle all that work)

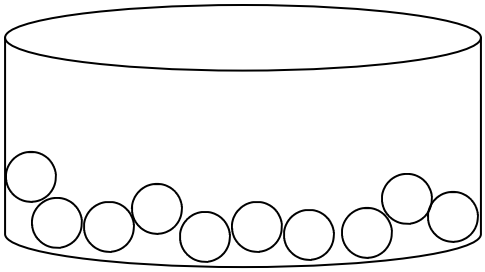
1. $O_{2(G)}$
2. $H_2O_{(L)}$
3. $N_{2(G)}$
4. $CH_{4(G)}$
5. $Cl_{2(G)}$



The ratio of particles to particles here is _____

It could be… (circle all that work)

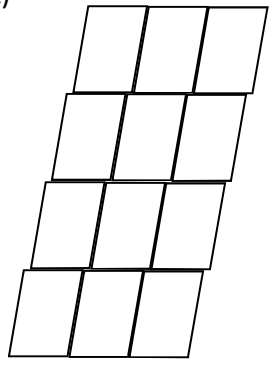
1. $Fe_{(S)}$
2. $H_2O_{(L)}$
3. $NH_{3(L)}$
4. $CH_{4(G)}$
5. $CO_{2(G)}$



The ratio of particles to particles here is _____

It could be… (circle all that work)

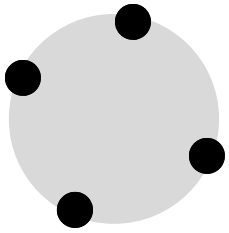
1. $Cu_{(S)}$
2. $Pb_{(L)}$
3. $Mg_{(S)}$
4. $H_{2(G)}$
5. $I_{2(S)}$



The ratio of particles to particles here is _____

It could be… (circle all that work)

5. CH_4

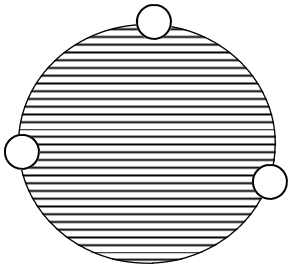


The ratio of particles to particles here is _____

It could be… (circle all that work)

2. PCl_3

3. NH_3



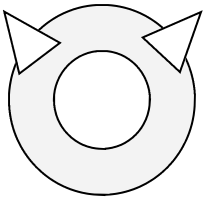
The ratio of particles to particles here is _____

It could be… (circle all that work)

1. H_2O

3. CO_2

4. SiO_2

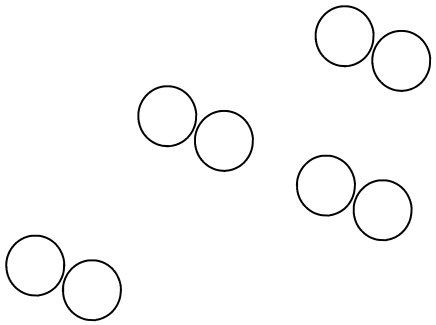


The ratio of particles to particles here is _____

It could be… (circle all that work)

1. H_2

2. Cl_2



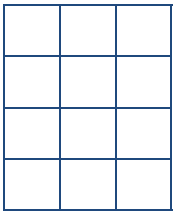
The ratio of particles to particles here is _____

It could be… (circle all that work)

3. $H_2O_{(S)}$

4. $Cu_{(S)}$

5. $CO_{2(S)}$



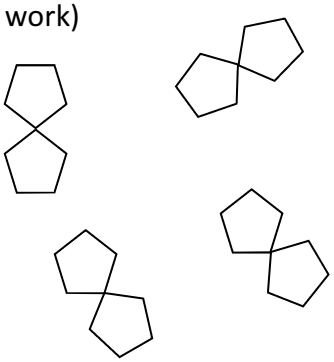
The ratio of particles to particles here is _____

It could be… (circle all that work)

1. $O_{2(G)}$

3. $N_{2(G)}$

5. $Cl_{2(G)}$

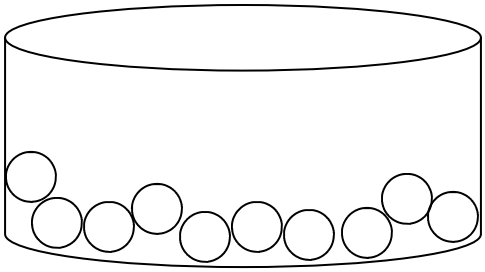


The ratio of particles to particles here is _____

It could be… (circle all that work)

2. $H_2O_{(L)}$

3. $NH_{3(L)}$



The ratio of particles to particles here is _____

It could be… (circle all that work)

1. $Cu_{(S)}$

3. $Mg_{(S)}$

5. $I_{2(S)}$