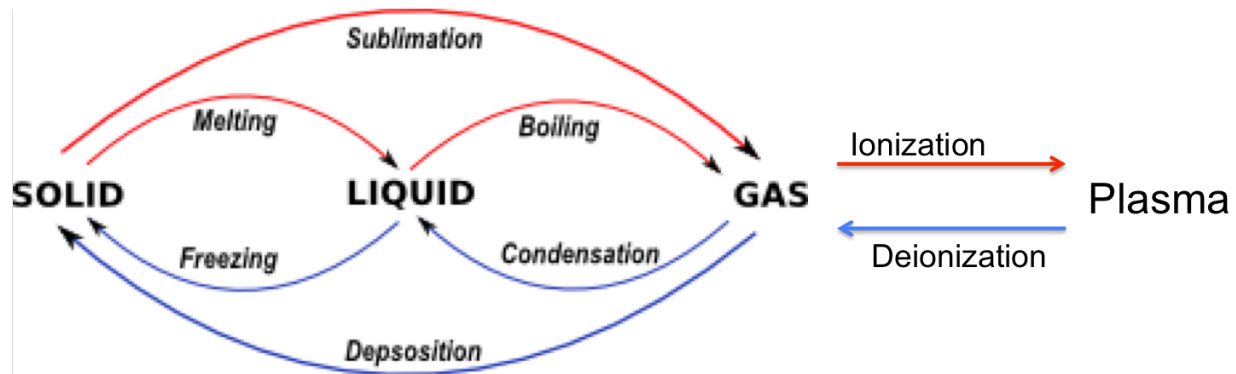


## Matter

All of the stuff in the universe.

Made of protons, neutrons, and electrons.

Comes in 4 states: solid, liquid, gas, and plasma.



### C.1

Use the diagram above to write the name of each process:

Process	Name	Process	Name
Liquid to Solid		Solid to liquid	
Liquid to Gas		Gas to plasma	
Gas to liquid		Gas to solid	
Solid to Gas		Plasma to gas	

### C.2

For each process, give the name:

Process	Name
You put water in the freezer and it becomes ice.	
Water vapor in the air changes into water when it touches a cold surface.	
Liquid nitrogen turns into the air that you breath.	

# AIR

Name \_\_\_\_\_

Dry ice [which is a solid] turns into air.	
Electrons move from clouds to the ground and turn the air into plasma.	

## Part B: Introduction to AIR

Molecule	Chemical Structure	Percentage of air
Nitrogen	N <sub>2</sub>	78%
Oxygen	O <sub>2</sub>	21%
Argon	Ar	1%
Carbon Dioxide	CO <sub>2</sub>	0.03%
Water Vapor	H <sub>2</sub> O	Depends on humidity

### *Air Trivia*

For each statement, select a component of the air that applies best:

[If you don't know these all, that's okay]

Is the largest component of air:

Our bodies use it to make energy. Without it we die:

Can condense into drops of water on a cold soda bottle:

We have *lots* of it in the air of Fall River, but there is very little of this in the air of Arizona:

Humans blow this *out* when they breath:

Plants use this to build their structures:

## Part C: Thermal Energy in Air

### Temperature

The *temperature* of the air represents the *speed of the air molecules*.

Hotter air molecules are moving faster  
Cooler air molecules are moving slower

### Heat Convection

Hotter (faster moving) air molecules will *rise above* other air molecules (like in a fire)  
Cooler (slower moving) air molecules will *fall below* other air molecules.

Where are the air molecules moving faster: in this room or in a freezer?

Where are the air molecules moving faster: outside on a summer day or outside on a winter day?

Where are the air molecules moving faster: in this room or in an oven that is baking cookies?

What will warmer air coming out of a fire do?

What will cooler air coming out of a freezer do?

# AIR

Name \_\_\_\_\_

## Part D: Non-Gas forms of each of the elements of the air:

Any gas can be condensed into a liquid and frozen into a solid.  
For three of the components of air, we can do that in *this room*.

Gas Form	Liquid Form	Solid Form
Nitrogen	Liquid Nitrogen	
Carbon Dioxide	NA	Dry Ice
Water Vapor	Water	Ice (wet ice)

Which elements of the air are *possible* to change into liquids and solids?

Which elements of the air can we change into liquids and solids easily in this class?

### *Dry Ice Questions*

Why is dry ice called *dry* ice? [What makes it different from normal ice?]

Is it safe to breath the vapors coming out of dry ice:

Are the vapors colder or *warmer* than the air around them? How can you tell?