

What's the Matter?





What is matter?

Anything that has Mass and

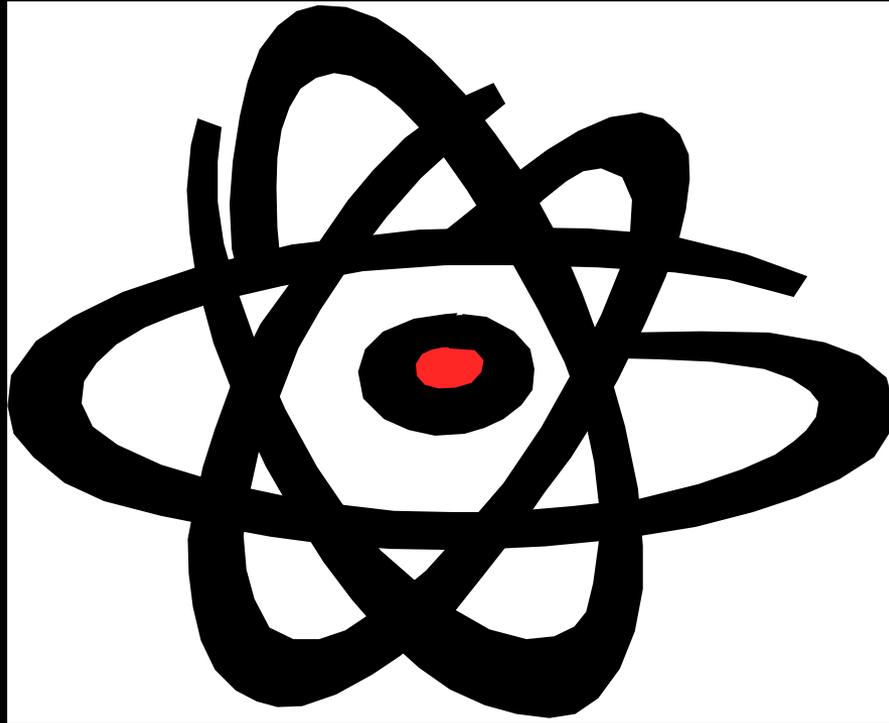
takes up Space.



Examples of matter:

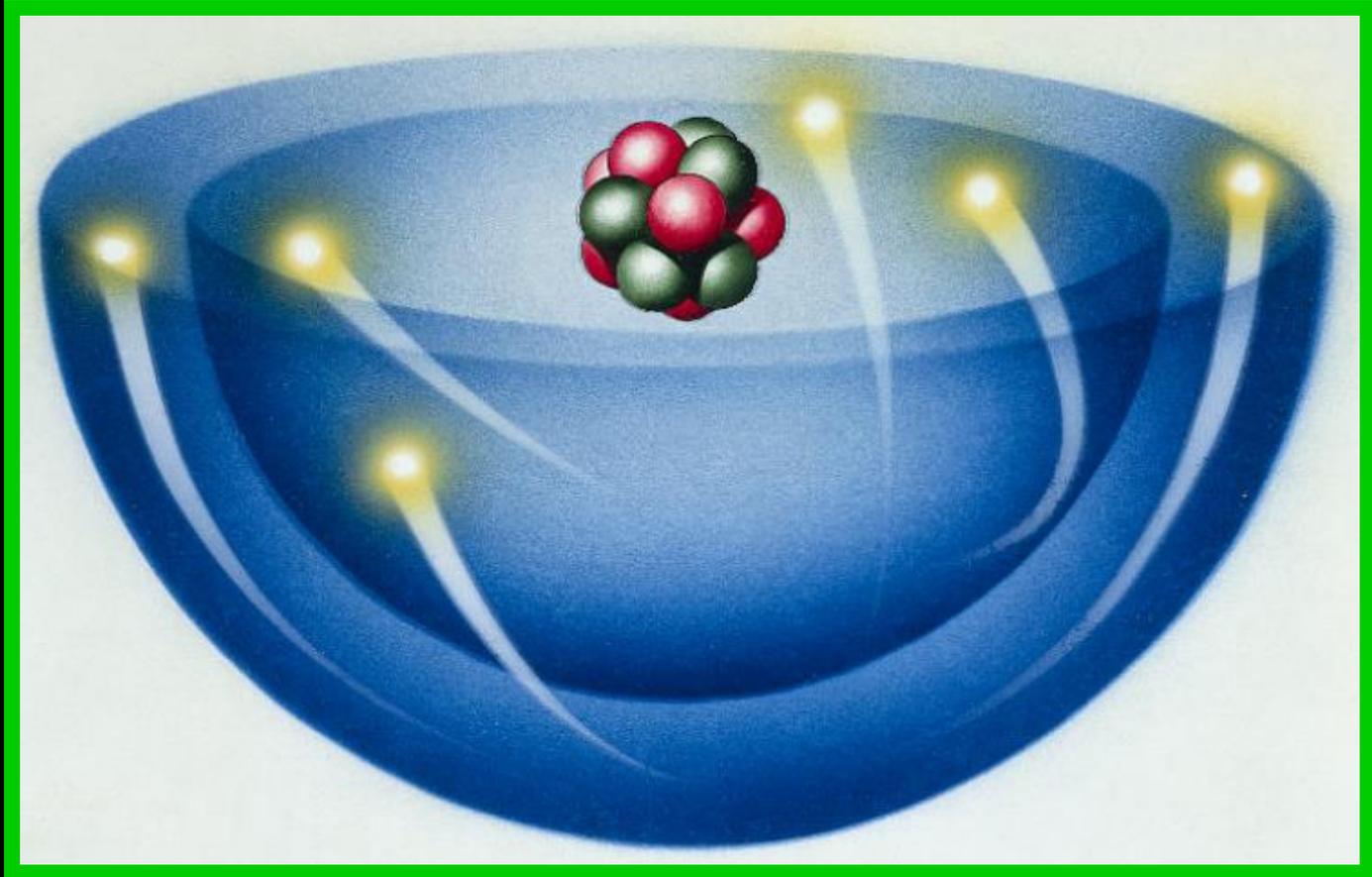


What is matter made of?



All matter is composed of one or more elements. There are about 100 natural elements. The smallest particle of an element that still has the properties of that element is called an atom.

The Atom



The atom is the smallest component of an element having the chemical properties of the element.

[Click here for music video.](#)

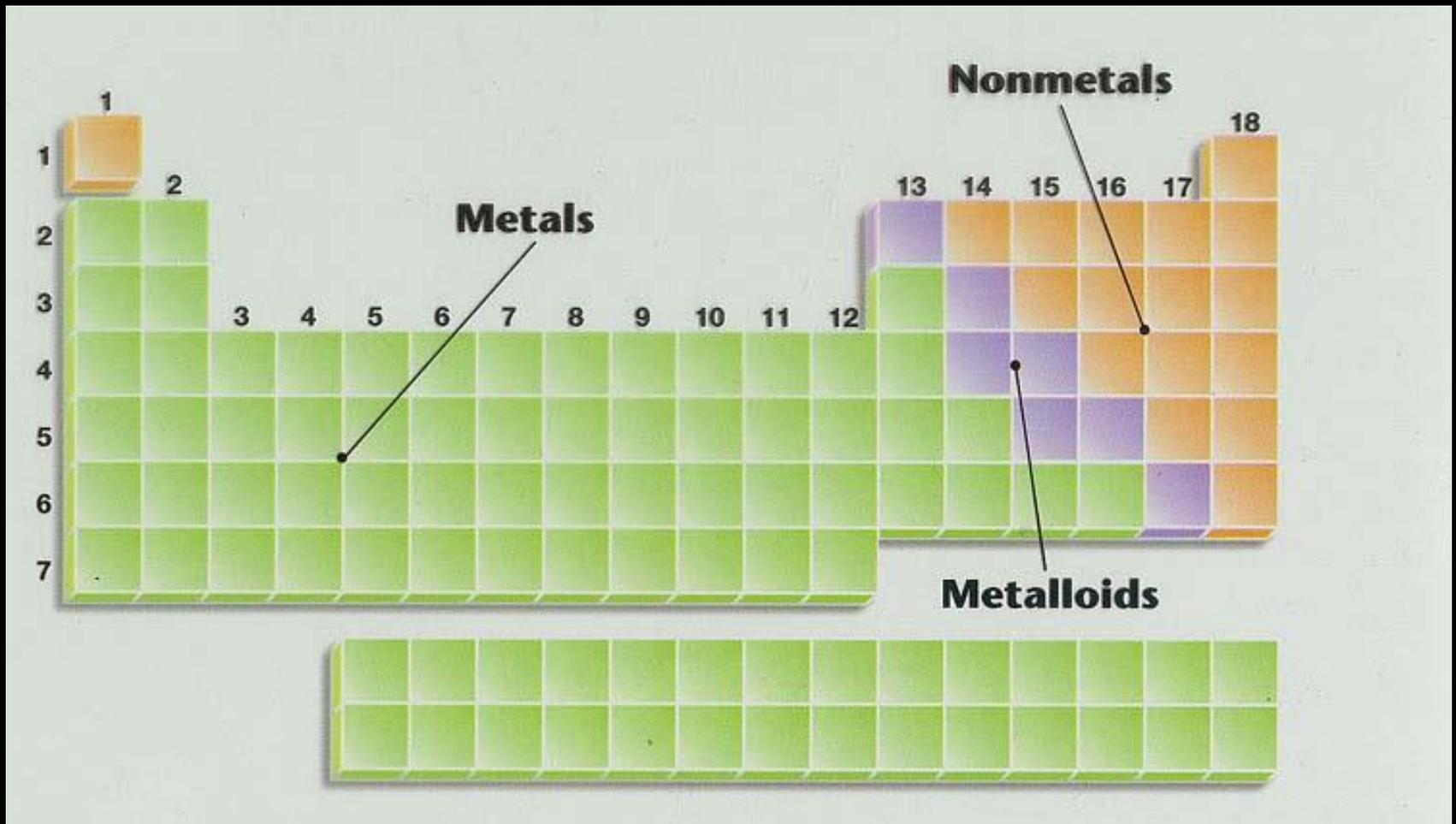
MEET THE ELEMENTS!

Periodic Table of the Elements

Color Legend																							
■ Alkali metals	■ Alkaline earth metals	■ Transition metals	■ Lanthanides	■ Actinides	■ Other metals	■ Semi-metals	■ Nonmetals	■ Noble gases															
1 H Hydrogen																	2 He Helium						
3 Li Lithium	4 Be Beryllium																	5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon
11 Na Sodium	12 Mg Magnesium																	13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulphur	17 Cl Chlorine	18 Ar Argon
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton						
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon						
55 Cs Cesium	56 Ba Barium	57-71 Lanthanides see below	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon						
87 Fr Francium	88 Ra Radium	89-103 Actinides see below	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Uu Ununilium														
Lanthanides		57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium							
Actinides		89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium							

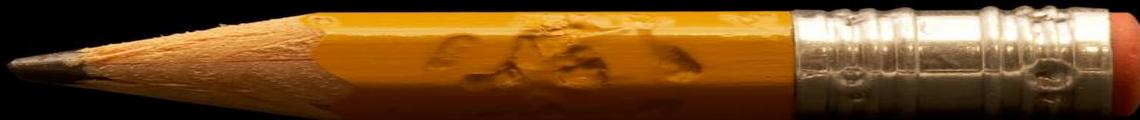
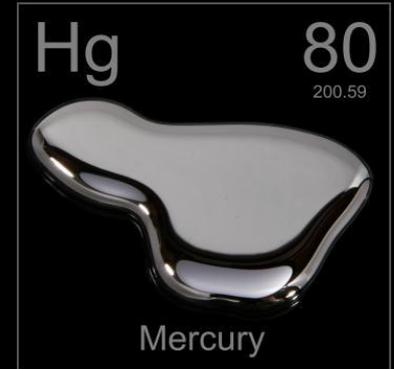
[Photographic Periodic Table](#)

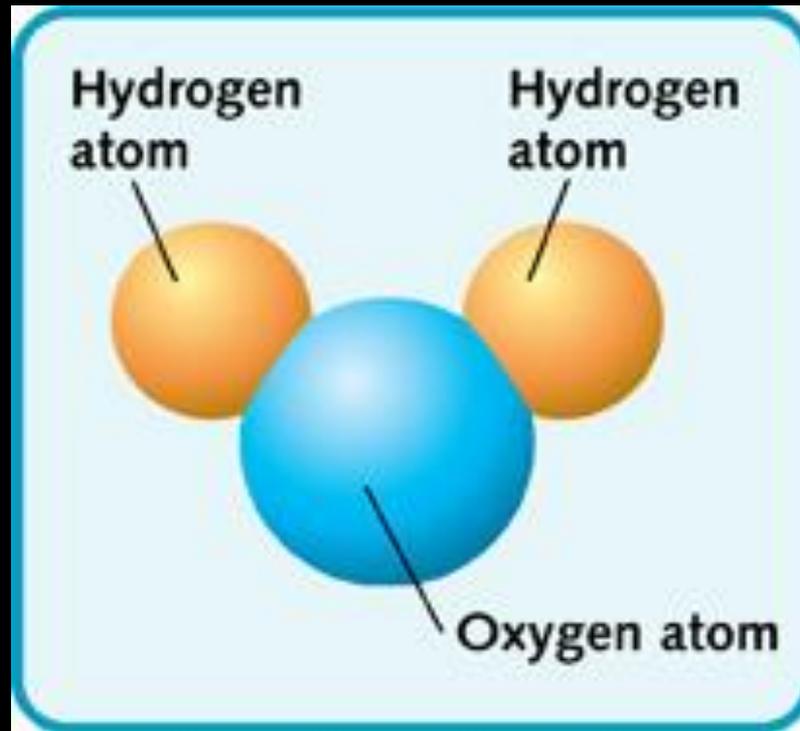
Most of the elements on the periodic table are METALS.



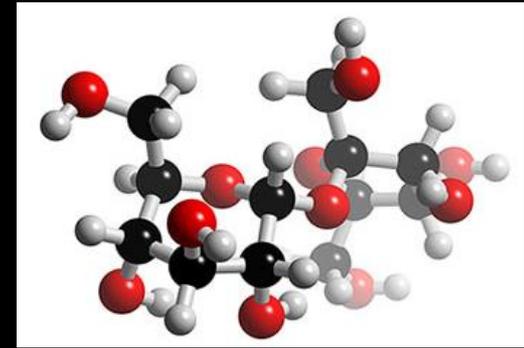
Interesting Facts:

- Most elements are metals.
- Only one metal is a liquid at room temperature and that is mercury (Hg)
- Bromine, a nonmetal, is also a liquid at room temp.
- Pencil “lead” is not really lead anymore but is graphite, which is made of carbon. Diamonds are carbon too. The atoms are just arranged differently.

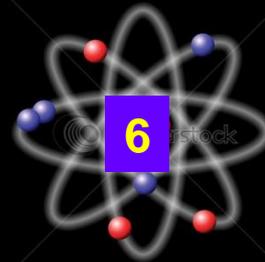




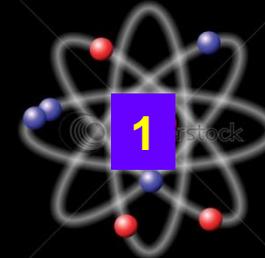
A water molecule is made up of hydrogen and oxygen atoms.



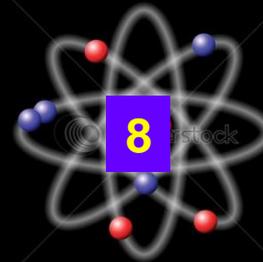
Sugar grains are made of molecules that are each made of 3 different types of atoms: carbon, hydrogen and oxygen.



C
carbon



H
hydrogen



O
oxygen

We are mainly made of carbon, hydrogen, oxygen and nitrogen.





Total Breakfast Cereal



Look at the different metals found in our cereal!

Nutrition Facts

Serving Size 0.75 cup (30g)

Amount per serving

Calories 97 Calories from Fat 6

Total Fat 1g **2**

Saturated Fat 0g **0**

Cholesterol 0mg **0**

Sodium 192mg **8**

Total Carbohydrates 22g **7**

Dietary Fiber 3g

Sugars 5g

Protein 3g

Vitamin A	10%	Vitamin C	100%
Calcium	110%	Iron	124%
Thiamin	141%	Riboflavin	142%
Niacin	132%	Pantothenic Acid	106%
Vitamin B6	141%	Vitamin B12	107%
Folic Acid	118%	Vitamin D	10%
Potassium	3%		9%
Magnesium	10%	Zinc	116%
Copper	6%		%

* Percent Daily Values are based on a 2,000 calorie diet.

2 Ways to Describe Matter:

✓ **Physical Properties**

✓ **Chemical Properties**

EXAMPLES OF PHYSICAL PROPERTIES

Color

Texture

Size

Shape



Taste



STATE OF MATTER

Density

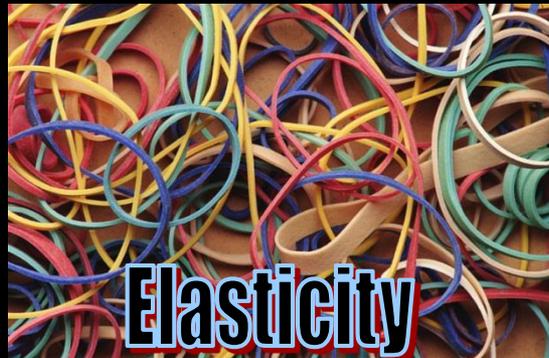


LUSTAY

ELECTRICAL CONDUCTIVITY



HEAT CONDUCTIVITY



Elasticity



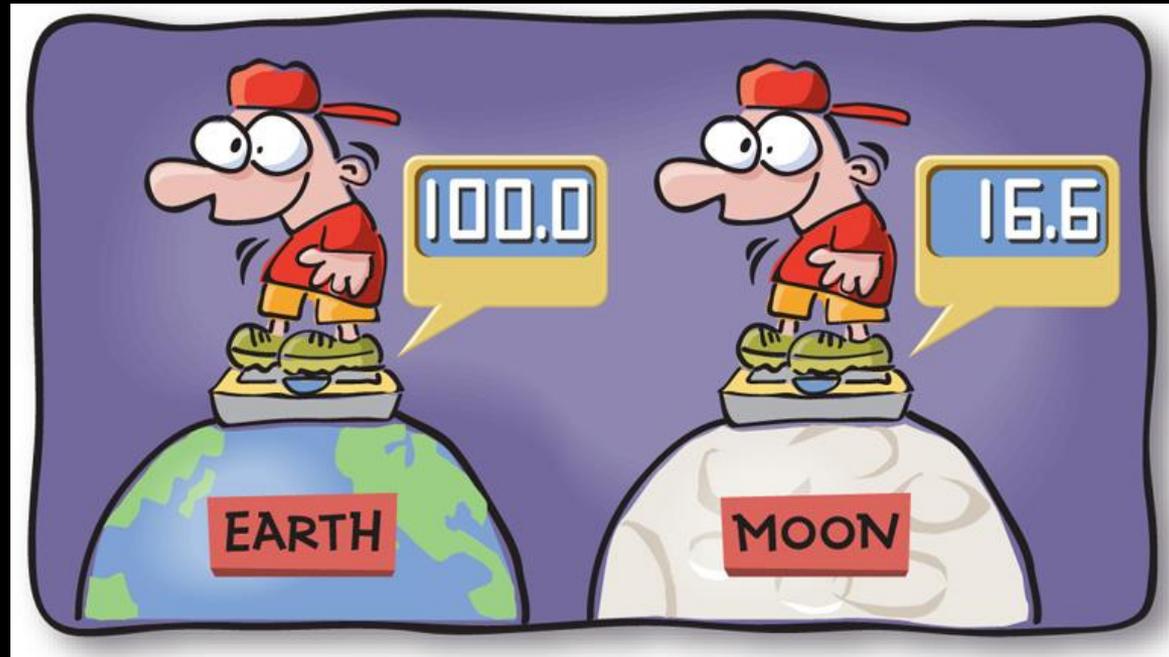
MAGNETIC

What is mass?

Mass is how much “stuff” is in an object.



Weight is different from mass.



Weight depends on GRAVITY.

Your weight on other worlds.

Mass is independent of gravity.



Mass = 120kg
Weight = 120×10
= 1200N

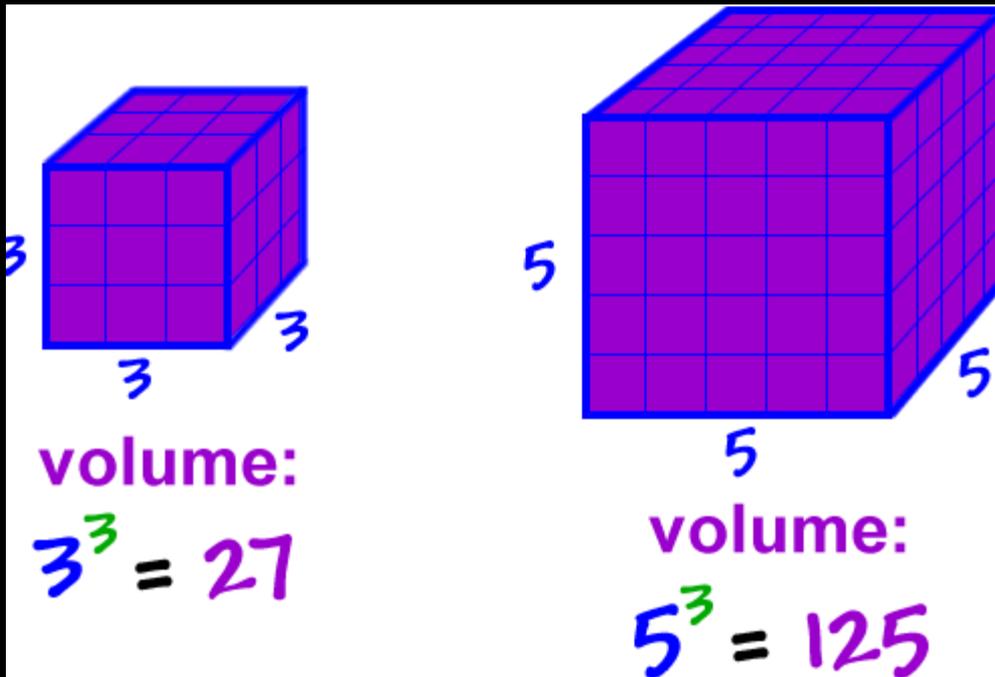


Mass = 120kg
Weight = 200N

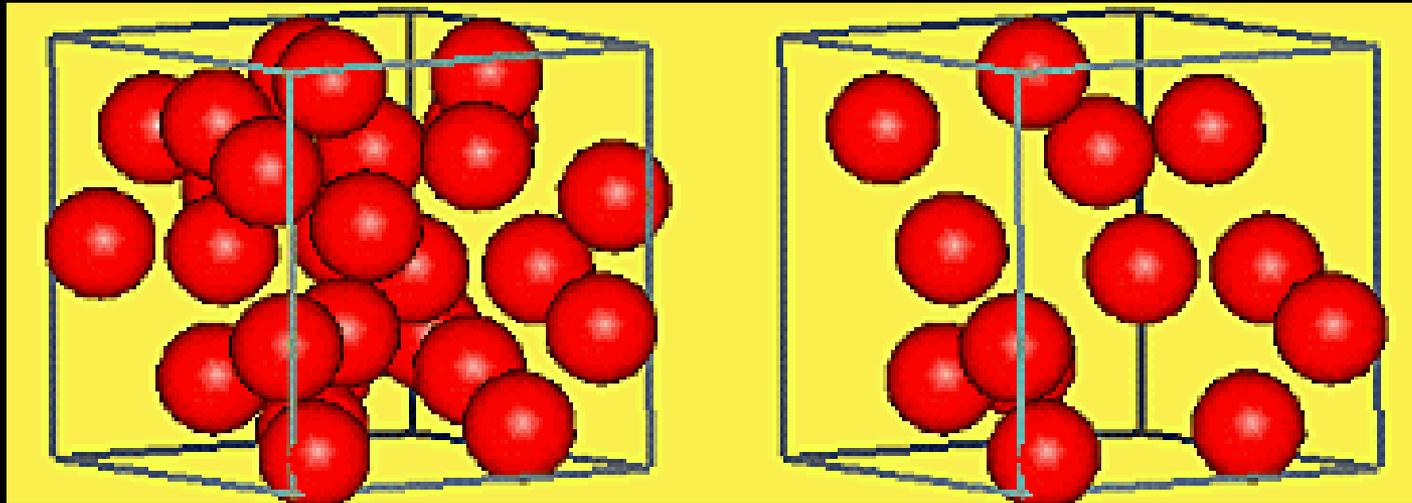
[Gizmo interactive link](#)

What is volume?

How much space an object takes up.



Density is the ratio of mass to volume.



States of Matter

1.

2.

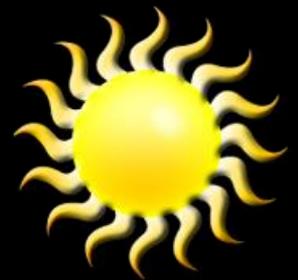
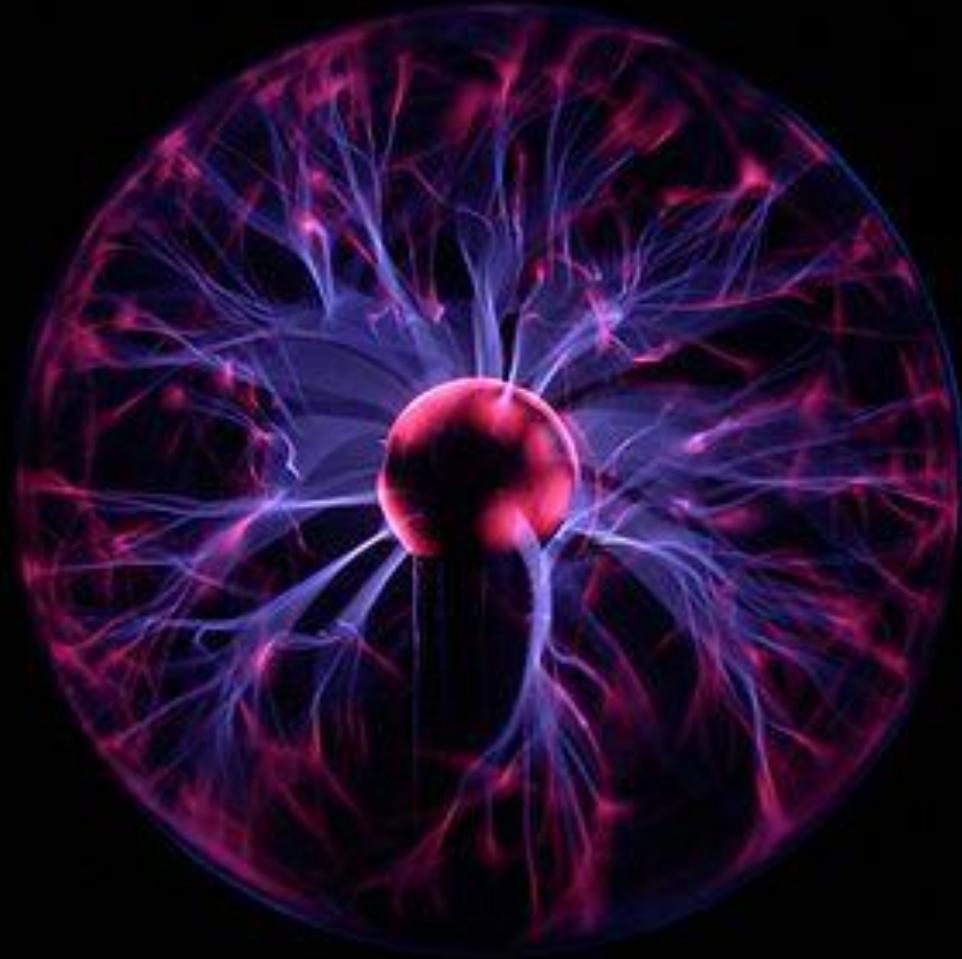
3.

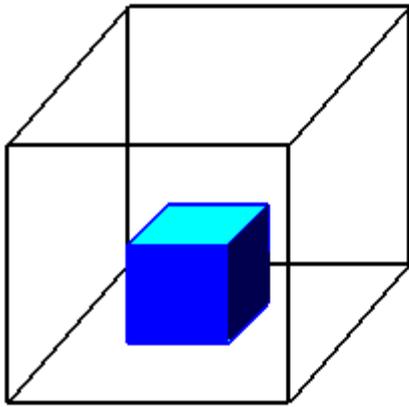
4.

[States of Matter Music Video](#)

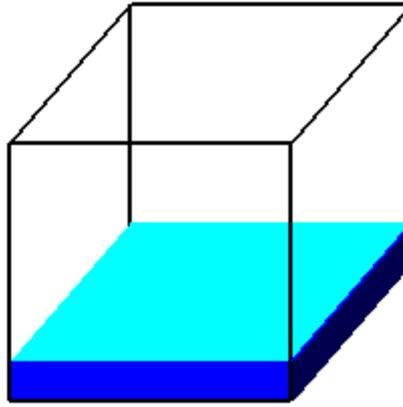


PLASMA

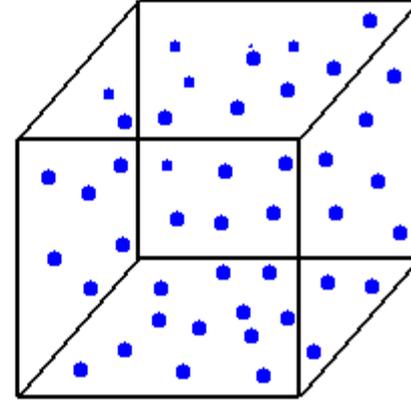




SOLID



LIQUID



GAS

Animation 1



SOLIDS

- **DEFINITE VOLUME**

- **DEFINITE SHAPE**



LIQUIDS



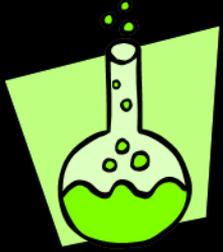
- TAKE SHAPE OF CONTAINER

- DEFINITE VOLUME

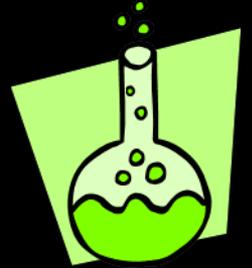


GASES

- **NO DEFINITE VOLUME**
- **NO DEFINITE SHAPE**



Chemical Properties



Describes how materials react
with other materials.



Chemical Properties



- Ability to burn
- Ability to rust
- Ability to change to a new substance when heated
- Ability to tarnish

