

# Elements and Compounds

Fix on your sheet

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 Aluminium	14 Si Silicon	15 P Phosphorus	16 S Sulfur	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 La Lanthanum	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 Ac Actinium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium															

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
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

## Let's think of FOOD



## Ingredients of Cookies

- |  |   |
|--|---|
| <input type="checkbox"/> 1 cup butter, softened      | <input type="checkbox"/> 1 teaspoon baking soda           |
| <input type="checkbox"/> 1 cup white sugar           | <input type="checkbox"/> 2 teaspoons hot water            |
| <input type="checkbox"/> 1 cup packed brown sugar    | <input type="checkbox"/> 1/2 teaspoon salt                |
| <input type="checkbox"/> 2 eggs                      | <input type="checkbox"/> 2 cups semisweet chocolate chips |
| <input type="checkbox"/> 2 teaspoons vanilla extract | <input type="checkbox"/> 1 cup chopped walnuts            |
| <input type="checkbox"/> 3 cups all-purpose flour    |   |

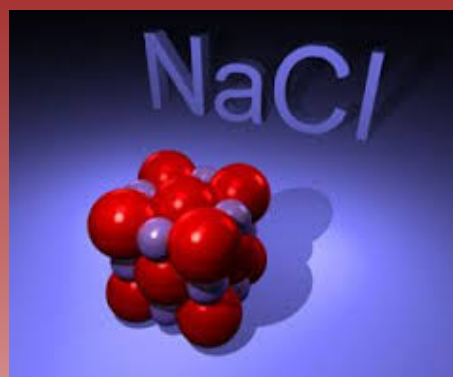
# Let's take a closer look



Nutrition Facts			
Butter ▾			
Amount Per 100 grams ▾			
Calories 717			
			% Daily Value*
<b>Total Fat</b> 81 g			124%
Saturated fat 51 g			255%
Polyunsaturated fat 3 g			
Monounsaturated fat 21 g			
Trans fat 3.3 g			
<b>Cholesterol</b> 215 mg			71%
<b>Sodium</b> 11 mg			0%
<b>Potassium</b> 24 mg			0%
<b>Total Carbohydrate</b> 0.1 g			0%
Dietary fiber 0 g			0%
Sugar 0.1 g			
<b>Protein</b> 0.8 g			1%
Vitamin A	49%	Vitamin C	0%
Calcium	2%	Iron	0%
Vitamin D	15%	Vitamin B-6	0%

## Let's take a closer look

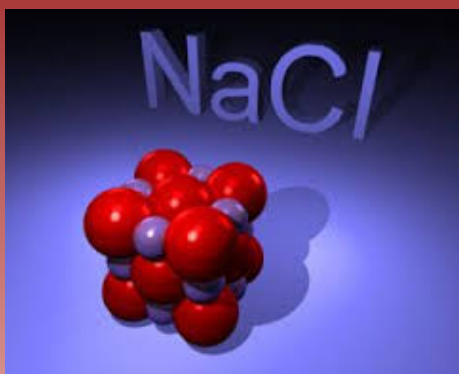
### Sodium





## Let's take a closer look

### Sodium Chloride



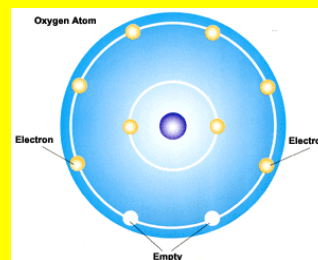
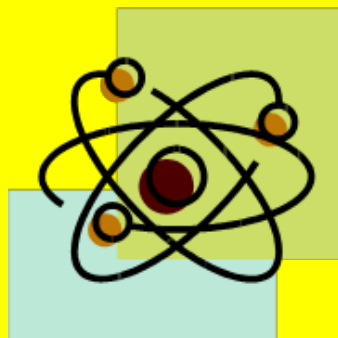
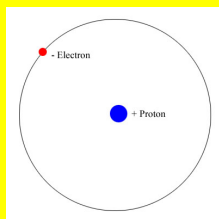
## Let's think of FOOD

**If you keep cutting matter into smaller and smaller pieces, you would eventually get to the tiniest possible pieces of matter. (Table 1 page 44.)**

# Particle Theory of Matter

## ✂ Part 1

- ✂ • All matter is made up of tiny particles called atoms



## Particle Theory of Matter

### Part 2

- All particles from one substance are the same. Different substances are made of different particles



ie) a diamond is a pure substance that contains only carbon particles.

## Particle Theory of Matter

### Part 3

- The particles are always moving. The more energy the particles have, the faster they move.

Heat will speed up the movement of the particles as it gives them more energy.

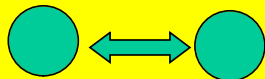


# Particle Theory of Matter

## Part 4

- There are forces between the particles that cause them to be held together. These forces are stronger when the particles are closer together.

Particles close together = strong force



Particles far apart = weak force




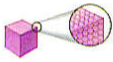
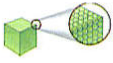
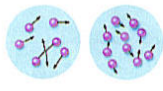


## What is a theory ?

An idea used to explain something about the world.

**A theory is a general principle or body of principles that has been developed to explain a wide variety of phenomena**

**. A scientific theory is NOT a wild guess. It must be consistent with known experimental results and it must have predictive power. As new knowledge is gained, theories are refined to better explain the data.**

**Table 1 The Particle Theory of Matter**

Principle	Illustration
<p>1. All matter is made up of tiny particles.</p>	
<p>2. All particles of one substance are the same. Different substances are made of different particles.</p>	<p>substance A </p> <p>substance B </p>
<p>3. The particles are always moving. The more energy the particles have, the faster they move.</p>	 <p>hot      cold</p>
<p>4. There are attractive forces between the particles. These forces are stronger when the particles are closer together.</p>	<p>particles far apart—force weak</p>  <p>particles close together—force strong</p> 



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## Changes of State

Sim Objective: Understand how a change of state happens in a solid, liquid or gas, in terms of energy and particle movement.

You are presented with a thermometer, a beaker of water and a particle window.

Increase or decrease the temperature of the water by dragging the arrow beside the thermometer, either up or down.

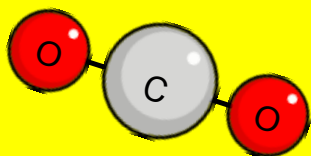
The changes in the water's state will appear in the particle window.

Begin

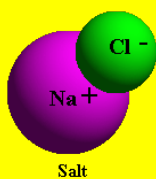
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According to the theory, there are 2 categories of substances;



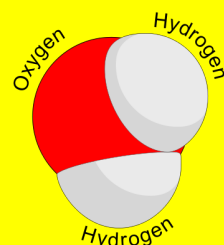
## 2 categories of Substances

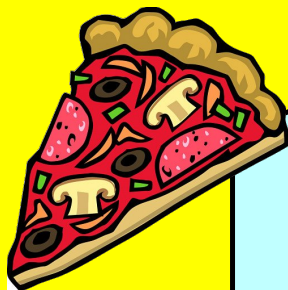


Salt

**1) Pure Substances**  
Contains only one kind of particle. Can be an element or a compound

- Ex. Aluminum, gold, copper, oxygen
- Ex. Sugar, table salt





## 2) Mixtures

Contain at least two different pure substance, or two different types of particles.

- Ex. Pop, bread, ice cream



## Attachments

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atoms.avi

Periodic Table.avi

compounds and mixtures.avi