

## Wellkom notes:

Email: m.beex@mencia.nl

### Materials:

Notebook  
Textbook  
Calculator

All the learning material is from your notes,  
not textbook

## Writing a Report:

- Title page: IF there is no title page or missing  
Name thing on it, the paper can not be  
Class graded  
Teacher  
Date

- Research Question  
This is the question you want to be answered.  
Like: What is ... or How does ... work?

- Theory:  
What is the theoretical background of your  
research?

What are your formulas?  
Which variables did you use?  
Why did you use those formulas and variables?

- Materials:  
List of used materials

- Experiment Method:  
How did you perform the experiment?  
Like a manual, which steps do I need to  
take?

### - Results:

Which results are been received from the experiments

What are your answers?

These results are going to help you explaining your research question.

Write down the necessary calculations

### - Conclusion:

What went well and what went bad?

What is the answer to your research question-

Due to the results we can conclude that the research question is true.

Also explain the mistakes in your research

### Tips:

1. Your answers are not wrong for the paper you will be graded on the process

2. Make sure you explain your mistakes

## Substances Notes

Everything is made out of substances (The material)

In this chapter, we are going to learn about those substances, how they interact with each other, and how those substances are been built. Substances can take a different form, it will always stay the same substance



Water  
↓  
Ice Cube  
↓  
Solid (s)



Water  
↓  
Water  
↓  
Liquid (l)



Water  
↓  
Water Vapor  
↓  
Gas (g)

# Building blocks of substances

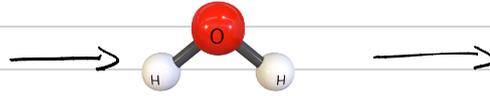
Substances are made out of particles

These particles are molecules and atoms

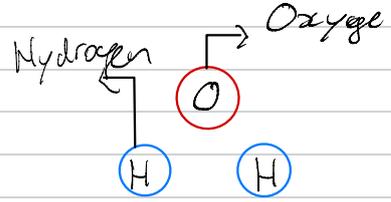
For example:



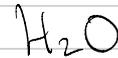
Water  
(the substance)



Water  
(Molecule)



Water  
(in Atoms)



## The periodic table of elements

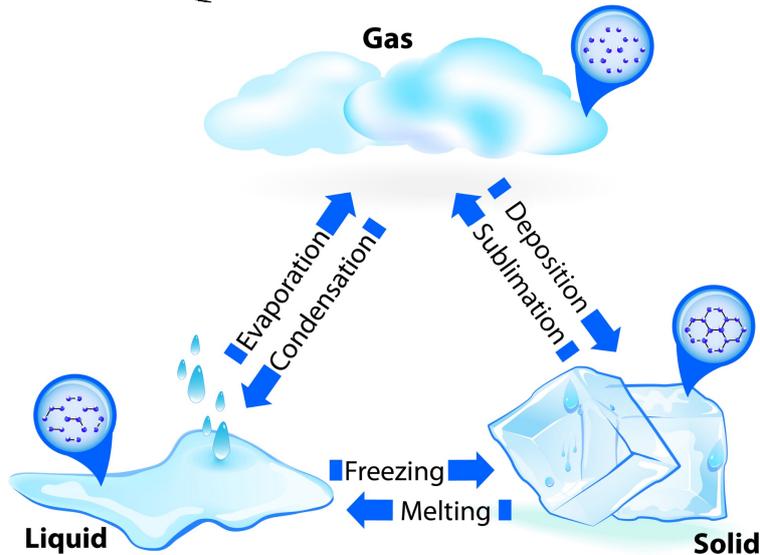
# PERIODIC TABLE OF ELEMENTS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																														
1 H Hydrogen 1.008																	2 He Helium 4.0026																														
3 Li Lithium 6.94	4 Be Beryllium 9.0122																5 B Boron 10.81	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180																									
11 Na Sodium 22.990	12 Mg Magnesium 24.305																13 Al Aluminium 26.982	14 Si Silicon 28.085	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.45	18 Ar Argon 39.948																									
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.630	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.798																														
37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.95	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.60	53 I Iodine 126.90	54 Xe Xenon 131.29																														
55 Cs Caesium 132.91	56 Ba Barium 137.33	57-71 Lanthanoids (Lanthanides)	72 Hf Hafnium 178.49	73 Ta Tantalum 180.95	74 W Tungsten 183.84	75 Re Rhenium 186.21	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.97	80 Hg Mercury 200.59	81 Tl Thallium 204.38	82 Pb Lead 207.2	83 Bi Bismuth 208.98	84 Po Polonium (209)	85 At Astatine (210)	86 Rn Radon (222)																														
87 Fr Francium (223)	88 Ra Radium (226)	89-103 Actinoids (Actinides)	104 Rf Rutherfordium (261)	105 Db Dubnium (268)	106 Sg Seaborgium (269)	107 Bh Bohrium (270)	108 Hs Hassium (271)	109 Mt Meitnerium (272)	110 Ds Darmstadtium (281)	111 Rg Roentgenium (282)	112 Cn Copernicium (285)	113 Nh Nihonium (286)	114 Fl Flerovium (289)	115 Mc Moscovium (290)	116 Lv Livermorium (293)	117 Ts Tennessine (294)	118 Og Oganesson (294)																														
For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.																																															
<table border="1"><tbody><tr><td>57 La Lanthanum 138.91</td><td>58 Ce Cerium 140.12</td><td>59 Pr Praseodymium 140.91</td><td>60 Nd Neodymium 144.24</td><td>61 Pm Promethium (145)</td><td>62 Sm Samarium 150.36</td><td>63 Eu Europium 151.96</td><td>64 Gd Gadolinium 157.25</td><td>65 Tb Terbium 158.93</td><td>66 Dy Dysprosium 162.50</td><td>67 Ho Holmium 164.93</td><td>68 Er Erbium 167.26</td><td>69 Tm Thulium 168.93</td><td>70 Yb Ytterbium 173.05</td><td>71 Lu Lutetium 174.97</td></tr><tr><td>89 Ac Actinium (227)</td><td>90 Th Thorium 232.04</td><td>91 Pa Protactinium 231.04</td><td>92 U Uranium 238.03</td><td>93 Np Neptunium (237)</td><td>94 Pu Plutonium (244)</td><td>95 Am Americium (243)</td><td>96 Cm Curium (247)</td><td>97 Bk Berkelium (247)</td><td>98 Cf Californium (251)</td><td>99 Es Einsteinium (252)</td><td>100 Fm Fermium (257)</td><td>101 Md Mendelevium (258)</td><td>102 No Nobelium (259)</td><td>103 Lr Lawrencium (260)</td></tr></tbody></table>																		57 La Lanthanum 138.91	58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.05	71 Lu Lutetium 174.97	89 Ac Actinium (227)	90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.03	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (260)
57 La Lanthanum 138.91	58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.05	71 Lu Lutetium 174.97																																	
89 Ac Actinium (227)	90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.03	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (260)																																	

Note: Each substances is made out of atoms from this periodic table of elements.

## Phase changes:

Every substance can change in one of the three phases. (Solid, Liquid, Gas)



Learn this!

## Solutions and Suspensions:

These are mixtures of substances

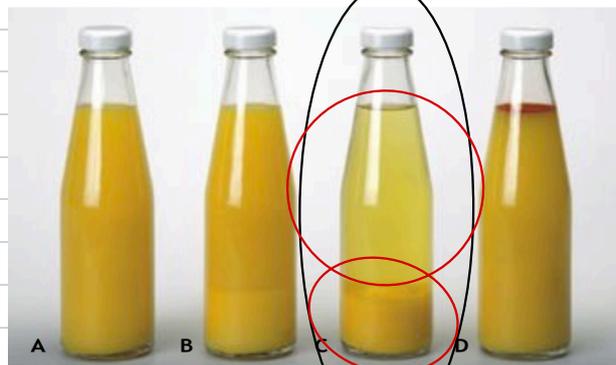
It's a **solution** if the substances **dissolve**  
It's a **suspension** when the substances **do not dissolve**

For example:

Orange juice



Solution



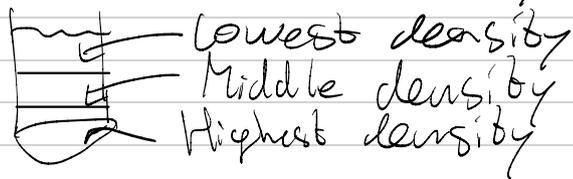
Suspension

# Separation Methods:

If you want to separate the substances of those mixtures, you use separation methods.

5 Methods:

- Sedimentation: Here you separate substances due to their density.



- Filtration: Here you separate substances with different sizes.



Coffee beans

Filtration

Coffee

- Extraction: Here we separate substances due to their **solubility**, the likelihood to dissolve.

