HILLCREST HIGH SCHOOL

NATURAL SCIENCE EXAM

GRADE 8 **JUNE 2022**
TIME: 2 HOURS **TOTAL: 100 MARKS**

EXAMINERS: MRS SMITH & MRS PRIOR
MODERATOR : MRS HARMSE

INSTRUCTIONS

1. **This question paper consists of 13 pages and 2 sections.**
   SECTION A : LIFE SCIENCE (50) SECTION B : PHYSICAL SCIENCE (50)
2. **Answer all of the questions from SECTIONS A to B in the ANSWER BOOK provided.**
3. **Non-programmable calculators may be used.**
4. **Number the answers correctly according to the numbering system used in this question paper.**
6. **Give brief motivations, discussions, et cetera where required.**
7. **Calculations must be rounded off to two decimal places where appropriate.**
8. **Leave a line between each answer and RULE OFF after each question 1 – 16.**
9. **A Periodic Table is attached at the end for your use. You may detach it from the question paper.**

SECTION A: (50)

QUESTION 1: MULTIPLE CHOICE QUESTIONS

For each of the following questions choose the correct LETTER of your choice. For example; 1.7. A

1.1. Animals that feed on plant matter only are called...

A. carnivores
B. herbivores
C. omnivores
D. predators (1)

1.2. The products of respiration are...

A. energy and water
B. food, carbon dioxide and water
C. food and oxygen
D. energy, water and carbon dioxide (1)

1.3. A population consists of...

A. different ecosystems
B. a collection of species
C. individuals of the same species
D. communities (1)

1.4. In a test for the presence of carbon dioxide in exhaled air…

A. lime water remains clear.
B. iodine turns blue/black.
C. clear lime water turns milky white.
D. milky lime water turns clear. (1)

1.5. An example of a plant that requires a low water supply is….

A. Water lily
B. Cactus
C. Sunflower
D. Rose bush (1)

1.6. The arrows in a food chain indicate...

A. which organism eats the next organism.
B. the flow of biomass.
C. the flow of energy.
D. the total amount of energy in the food chain. (1)

(6)

QUESTION 2:

MATCHING COLUMNS: Match Column A with Column B. Write down the numbers 2.1 to 2.6 alongside the margin and write **ONLY** the correct **LETTER** of your choice next to it.

COLUMN A	COLUMN B
2.1. The harmful effect of litter and waste on the environment.	A. Sunlight B. Mimicry C. Pathogens D. Pollution E. Camouflage F. Combustion G. Deforestation H. Adaptation I. Decomposition J. Extinct
2.2. An example of an abiotic factor.	
2.3. The ability of an animal to blend in with its natural environment.	
2.4. Breaking down of dead plant and animal remains.	
2.5. Disease causing agents.	
2.6. Characteristic that helps a living thing survive in its environment.	

(6)

QUESTION 3 :

Write down only one word/term to replace the following statements.

3.1. Different populations living and interacting in the same environment. (1)

3.2. The type of micro-organism that causes HIV. (1)

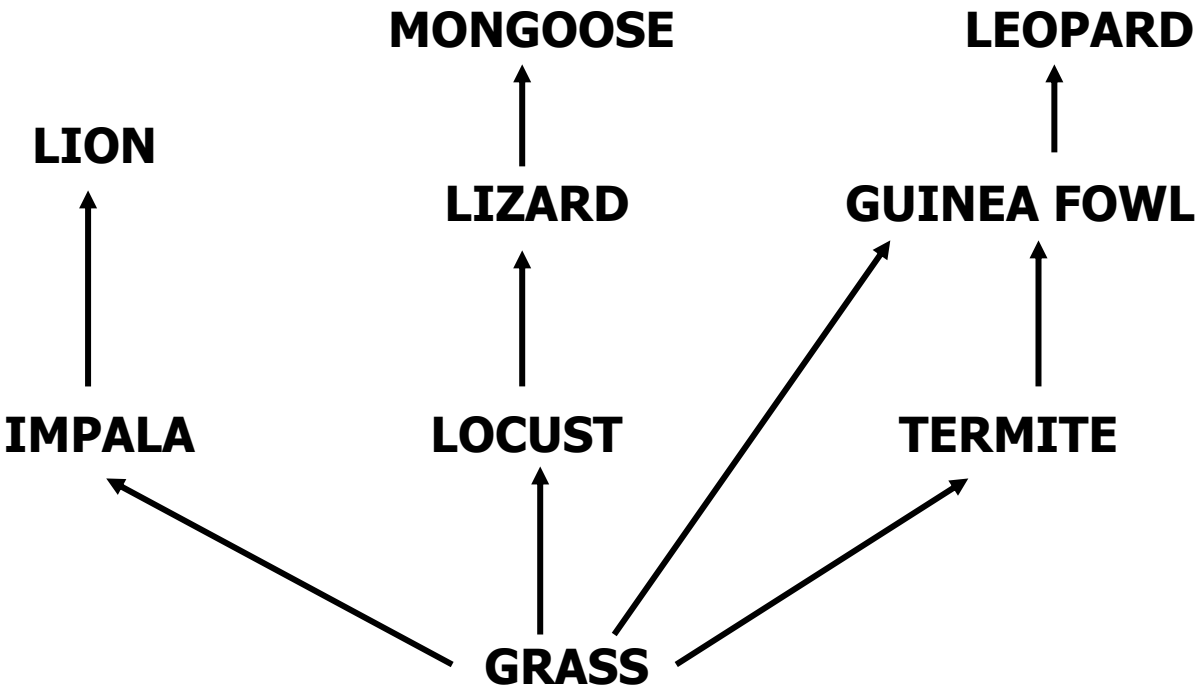
3.3. The name of the micro-organism used to make bread rise. (1)

3.4. The process that provides energy for the start of all feeding in nature. (1)

(4)

QUESTION 4:

Study the diagram of a grassland ecosystem and then answer the questions that follow.



4.1. Provide the name for the diagram shown above. (1)

4.2. Identify the producer. (1)

4.3. Draw ONE food chain consisting of FOUR organisms. (4)

4.4. Name an organism from the diagram that eats both plant and animal matter. (1)

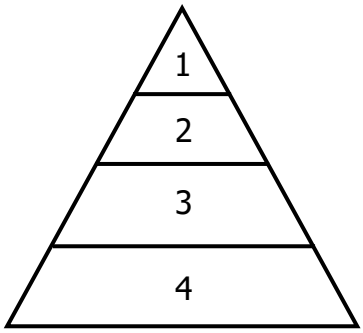
4.5. Predict what would happen if the number of locusts increased. (2)

4.6. Write down an example of a predator and explain how it is adapted to survive in the grassland. (3)

(12)

QUESTION 5:

5.1. Write down the numbers 1 – 4 in your answer book. Write ONLY the correct term next to each number corresponding with the food pyramid below.



Use the terms from the following list:

- Secondary consumer
- Autotroph
- Herbivore
- Lion/Hawk/Shark (4)

5.2. Can you have more carnivores than herbivores? Give a reason for your answer. (2)

(6)

QUESTION 6:

Study the diagrams below and answer the questions that follow:

DIAGRAM A

DIAGRAM B

6.1. Describe the type of habitat where the plant in Diagram A is found. (1)

6.2. Explain any adaptation that enables this plant to survive in its habitat. (2)

6.3. Name the type of behaviour displayed by the animal in Diagram B. (1)

6.4. Explain the advantage of this type of behaviour described in 6.3 above. (2)

(6)

QUESTION 7:

Study the statistics of an outbreak of Cholera in South Africa in 2001 and answer the following questions.

PROVINCE	TOTAL CASES RECORDED
EASTERN CAPE	20
FREE STATE	1
GAUTENG	65
KWAZULU-NATAL	105 708
MPUMALANGA	127
NORTHERN CAPE	0
LIMPOPO	193
NORTH WEST	6
WESTERN CAPE	1

7.1. Which province has the most cases of cholera recorded? (1)

7.2. Calculate the total number of cases that were recorded in 2001. Show ALL your working. (2)

7.3. Draw a BAR GRAPH showing the total cases recorded in the Eastern Cape, Gauteng, Mpumalanga and Limpopo. (5)

7.4. The micro-organism that causes Cholera is a water-borne bacterium. Explain how you would treat this infection. (2)

(10)

SUB TOTAL: 50

SECTION B: (50)

QUESTION 8:

For each question, Q 8.1 to Q 8.3 there is only one correct answer.

Write down only the letter (A – D) of your choice.

8.1. Which statement is INCORRECT for the behavior of gases?

When a gas changes phase and becomes a liquid…

A the forces of attraction between the particles of the substance increase

B the spaces between the particles of the substance decrease

C the partices of the substance lose energy to the surroundings

D the particles of the substance move faster (1)

8.2. Which of the following is a semi-metal (on the Periodic Table)

A silicon

B carbon

C aluminium

D nitrogen (1)

8.3. A man floats better in sea water than in fresh water because

A sea water is colder than fresh water

B sea water is denser than fresh water

C fresh water is denser than sea water

D sea water is salty (1)

(3)

QUESTION 9

Write down only one word/term to replace the following statements.

9.1. A pure substance made of two or more elements (1)

9.2. Force created by gas molecules hitting the sides of a closed container (1)

9.3. The process that uses electricity to decompose a compound into elements (1)

9.4. The movement of particles from an area of high concentration to an area of low concentration (1)

(4)

QUESTION 10:

10.1. Write down the chemical symbol for the following elements

10.1.1 sodium (1)

10.1.2 nitrogen (1)

10.2. Write down the name of the following elements

10.2.1 Ca (1)

10.2.2 K (1)

10.3. Write down the

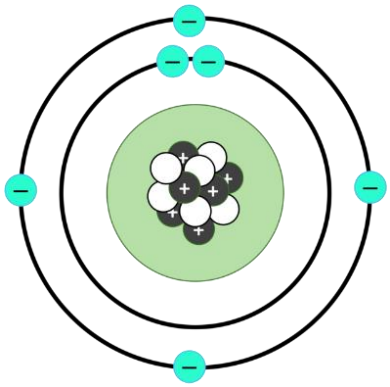
10.3.1 **symbol** of the element with an Atomic Number of 15 (1)

10.3.2 **name** of the element in group VIII (18), period 2 (1)

(6)

QUESTION 11:

Consider the following diagram of an atom of an element on the Periodic Table.



11.1. Name the positively charged particles found in the nucleus of the atom. (1)

11.2. What charge does an electron carry? (1)

11.3. Write down:

11.3.1. the name of this element (1)

11.3.2. the relative atomic mass of this element (1)

11.3.3. the number of neutrons in the nucleus of an atom of this element (1)

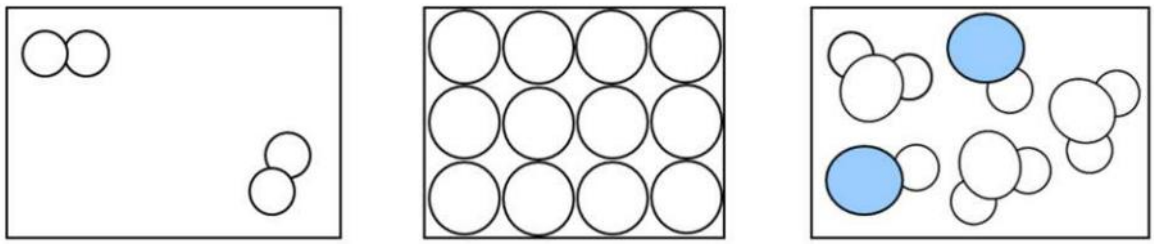
11.3.4. the atomic number of this element (1)

(6)

QUESTION 12:

The particle model of matter can be used to represent different substances A, B and C.

A B C



12.1. Which diagram, A, B or C, represents diatomic molecules? Give a reason for your answer. (2)

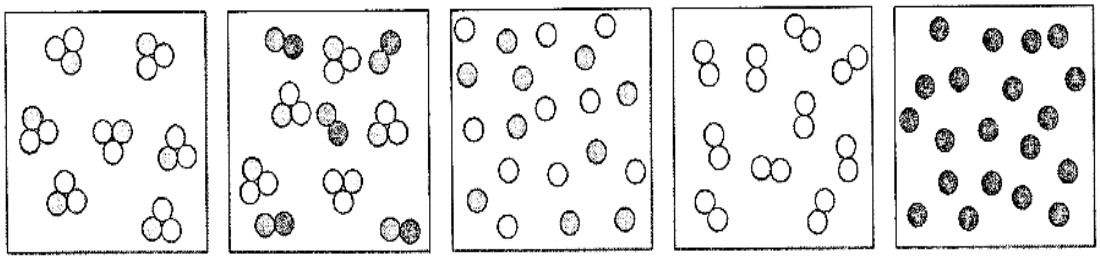
12.2. How many types of molecules are found in diagram C? (1)

12.3. Which diagram represents particles with the lowest average kinetic energy? (1)

(4)

QUESTION 13:

13.1. Study the diagrams **(1 – 5)** drawn below.



1 2 3 4 5

Match the statements in **column I** with the correct numbers in **column II.** Write the correct **letter** next to the correct **number** in your answer book (e.g A=4) (5)

COLUMN I		**COLUMN II**
A	copper atoms	1
B	oxygen molecules	2
C	salty water	3
D	water molecules	4
E	iron and sulphur atoms	5

13.2. Copy and complete the following word equations:

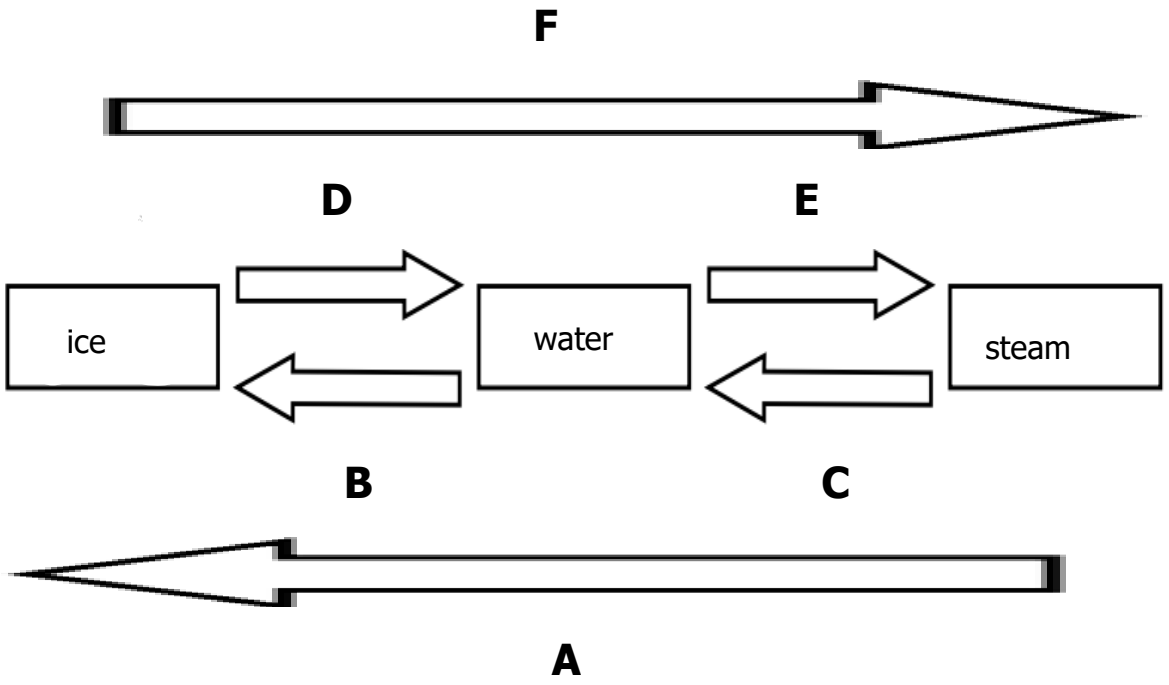
13.2.1. iron + sulphur → _____ (1)

13.2.2. copper (II) chloride → copper + _____ (1)

(7)

QUESTION 14:

Consider the diagram showing phase changes **(A – F)** in the Particle Model of Matter.



14.1. Name the process taking place at:

14.1.1. C (1)

14.1.2. E (1)

14.2. Say whether energy is **absorbed from** or **released to** the surroundings during the process labelled D. (1)

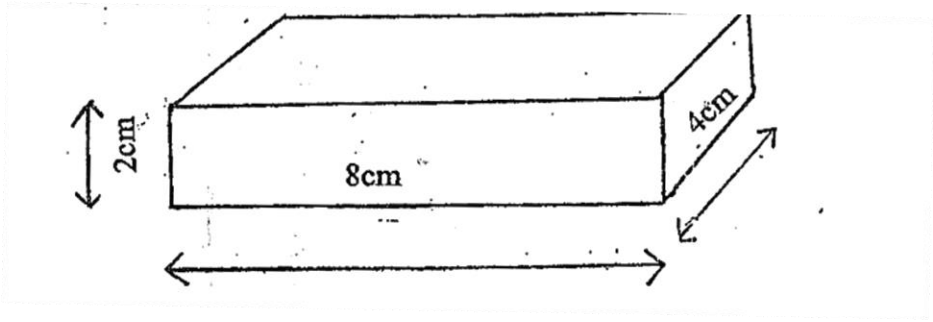
14.3. Which letter (**A**-**F**) shows the process of sublimation? (1)

14.4. Describe a gas in terms of the **Particle Model**. (Mention the forces and spaces between the particles) (2)

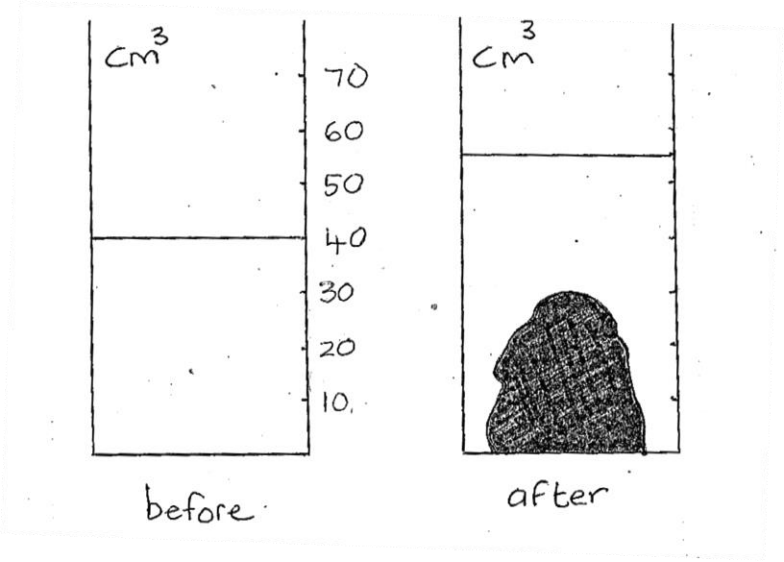
(6)

QUESTION 15:

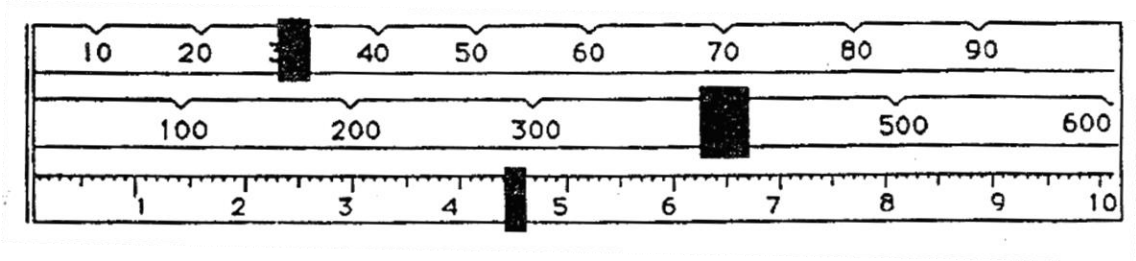
15.1. Calculate the volume of the block. Show your working. (2)



15.2. Calculate the volume of the stone. Show your working. (2)



15.3. Write down the reading on the triple beam balance. (1)



15.4. Using the formula $D=\frac{M}{V}$ calculate the following.

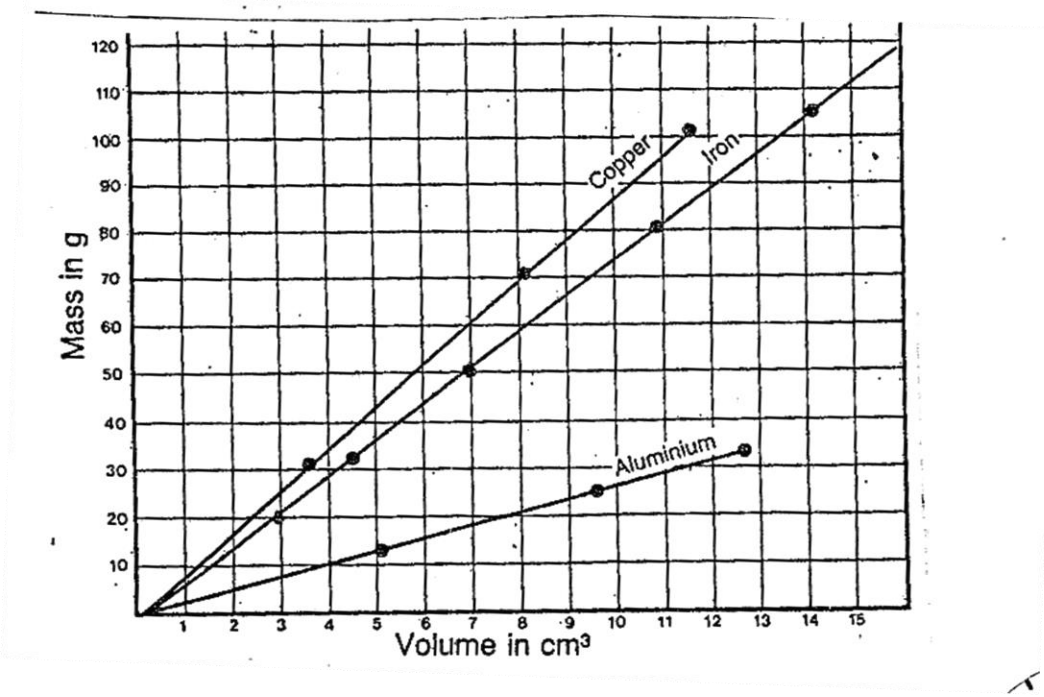
15.4.1. Calculate the mass of a wooden block that has a density of 0,5 g/cm^3 and a volume of 100 cm^3. (3)

15.4.2. Will the wooden block **sink** or **float** when placed in water? Provide a reason for your answer. (2)

(10)

QUESTION 16:

The graph below indicates the relationship between the MASS and the VOLUME of three metals : iron, aluminium and copper.



16.1. From the graph, read off and record

16.1.1.the mass of the 8 cm^3 of copper (1)

16.1.2.the volume of 80 g of iron (1)

16.2. State which of the two metals, copper or iron has the higher density and explain how you reached your conclusion just by looking at the graph. (2)

(4)

SUB TOTAL: 50

TOTAL: 100

TABLE 3: THE PERIODIC TABLE OF ELEMENTS
TABEL 3: DIE PERIODIEKE TABEL VAN ELEMENTE

1 (I)	2 (II)	3	4	5	6	7	8	9	10	11	12	13 (III)	14 (IV)	15 (V)	16 (VI)	17 (VII)	18 (VIII)
2,1 **H** 1																	**He** 4
1,0 **Li** 7	1,5 **Be** 9											2,0 **B** 11	2,5 **C** 12	3,0 **N** 14	3,5 **O** 16	4,0 **F** 19	**Ne** 20
0,9 **Na** 23	1,2 **Mg** 24											1,5 **Aℓ** 27	1,8 **Si** 28	2,1 **P** 31	2,5 **S** 32	3,0 **Cℓ** 35,5	**Ar** 40
0,8 **K** 39	1,0 **Ca** 40	1,3 **Sc** 45	1,5 **Ti** 48	1,6 **V** 51	1,6 **Cr** 52	1,5 **Mn** 55	1,8 **Fe** 56	1,8 **Co** 59	1,8 **Ni** 59	1,9 **Cu** 63,5	1,6 **Zn** 65	1,6 **Ga** 70	1,8 **Ge** 73	2,0 **As** 75	2,4 **Se** 79	2,8 **Br** 80	**Kr** 84
0,8 **Rb** 86	1,0 **Sr** 88	1,2 **Y** 89	1,4 **Zr** 91	**Nb** 92	1,8 **Mo** 96	1,9 **Tc**	2,2 **Ru** 101	2,2 **Rh** 103	2,2 **Pd** 106	1,9 **Ag** 108	1,7 **Cd** 112	1,7 **In** 115	1,8 **Sn** 119	1,9 **Sb** 122	2,1 **Te** 128	2,5 **I** 127	**Xe** 131
0,7 **Cs** 133	0,9 **Ba** 137	**La** 139	1,6 **Hf** 179	**Ta** 181	**W** 184	**Re** 186	**Os** 190	**Ir** 192	**Pt** 195	**Au** 197	**Hg** 201	1,8 **Tℓ** 204	1,8 **Pb** 207	1,9 **Bi** 209	2,0 **Po**	2,5 **At**	**Rn**
0,7 **Fr**	0,9 **Ra** 226	**Ac**															

Ce 140	**Pr** 141	**Nd** 144	**Pm**	**Sm** 150	**Eu** 152	**Gd** 157	**Tb** 159	**Dy** 163	**Ho** 165	**Er** 167	**Tm** 169	**Yb** 173	**Lu** 175
Th 232	**Pa**	**U** 238	**Np**	**Pu**	**Am**	**Cm**	**Bk**	**Cf**	**Es**	**Fm**	**Md**	**No**	**Lr**

KEY/*SLEUTEL*

Atomic number
Atoomgetal

29
1,9 Cu
63,5

Electronegativity
Elektronegatiwiteit

Symbol
Simbool

Approximate relative atomic mass
Benaderde relatiewe atoommassa