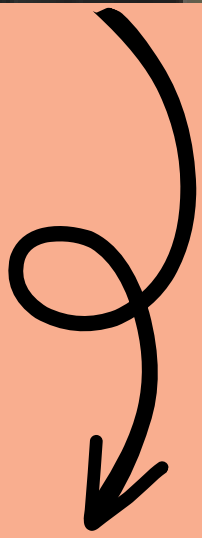




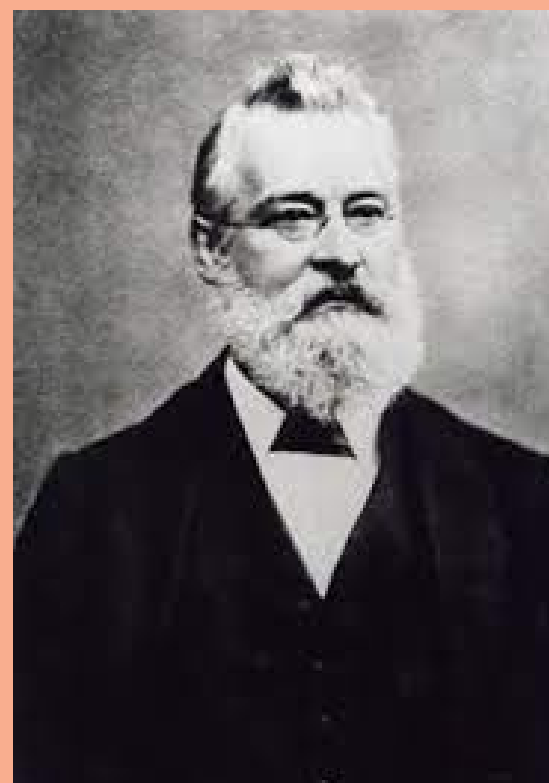
ANTOINE LAVOISIER (1743-1794)

Classified elements according to certain groups such as gases, non-metals, metals and metal oxides. However his classification was less accurate.



JOHANN W. DOBEREINER (1780-1849)

Classification was limited to several elements only. However his classification showed the relationship between the chemical properties of elements and atomic mass



JOHN NEWLANDS (1837-1898)

Arranged elements according to their increasing atomic masses. Arranged seven elements in a row because the chemical and physical properties of the first element recurred at every eighth element



LOTHAR MEYER

(1830-1895)

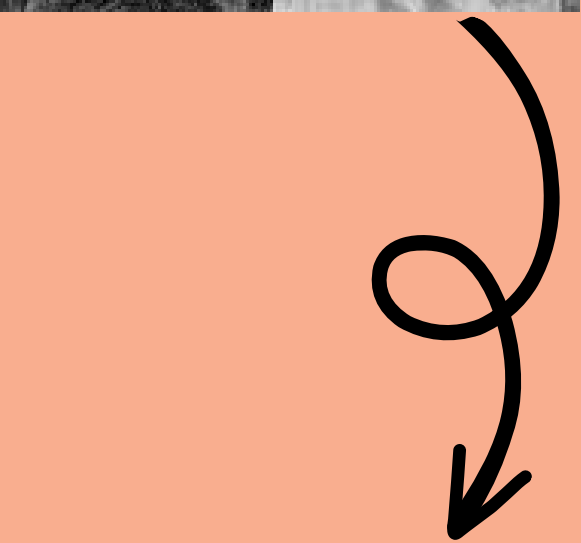
Plotted the graph atomic volume against atomic mass of elements. Elements at equivalent positions on the curve of the graph had similar chemical properties



DMITRI MENDELEEV

(1834-1907)

Arranged the elements according to their increasing atomic masses. Only elements with similar chemical properties were arranged in the same vertical columns.



HENRY MOSELEY

(1887-1915)

Found a relationship between the X-ray spectrum and proton numbers. Proposed each elements ought to have its own proton number.

THE DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

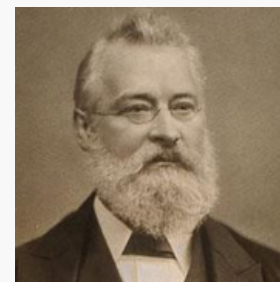
1743 - 1794

Antoine Lavoisier, classified elements according to gases, non-metals, metals and metal oxide.



1837 - 1898

John Newlands, arranged elements according to their increasing of atomic masses. He named the arrangement as the Law of Octaves.



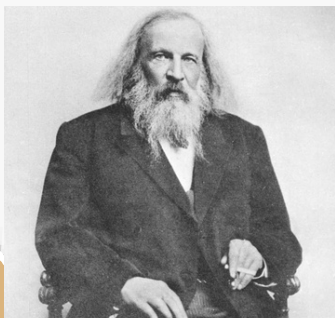
1780 - 1849

Johann W. Dobereiner's classification showed the relationship between the chemical properties of elements and atomic mass.



1830 - 1895

Lothar Meyer, plotted graph of atomic volume against atomic mass of elements and found that elements at the equivalent positions had the same chemical properties.



1834 - 1907

Dmitri Mendeleev, arranged elements according to their increasing atomic masses. Elements with similar chemical properties were arranged in the same vertical columns.



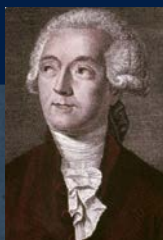
1887 - 1915

Henry Moseley, found the relationship between the X-ray spectrum and proton numbers. He arranged the elements in the Periodic Table of Elements according to their increasing proton numbers.

THE DEVELOPMENT OF PERIODIC TABLE IN AN ELEMENT

ANTOINE LAVOISIER

- classified element according to certain group.
- his was less accurate because he classified light, heat and few other compounds into groups as elements



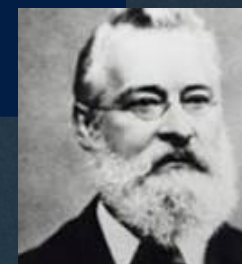
JOHANN W. DOBEREINER

- his classification classified to several elements only.
- the group consists of Cl, Br and iodine is called **triad**.
- showed relationship between chemical properties of elements and atomic mass.



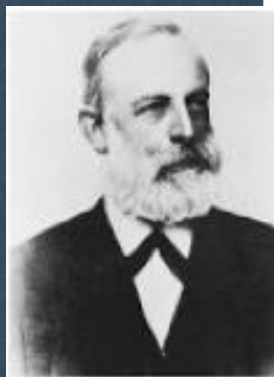
JOHN NEWLANDS

- arrange seven elements in a row named **law of octaves**.



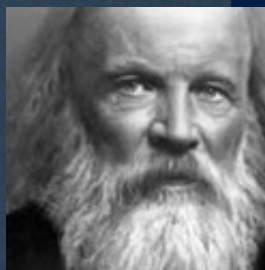
LOTHAR MEYER

- plot the graph of atomic volume against atomic mass of elements.
- found out that elements at equivalent positions on the curve of the graph had similar properties.



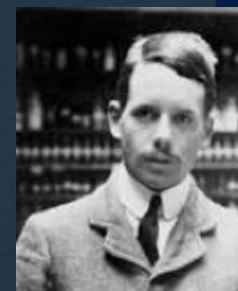
DMITRI MENDELEEV

- arranged the elements according to their increasing masses.



HENRY MOSELEY

- arranged the elements in periodic table according to their increasing proton numbers.



The Development of Periodic Table of Elements



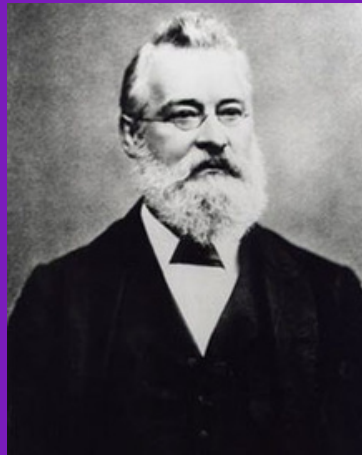
ANTOINE LAVOISIER

- Classified elements according to certain groups such as gases, non-metal, metals and metal oxides.
- The classification was less accurate because he classified light, heat and a few compounds into groups as elements.
- There were several elements that were classified into the same group but had different chemical properties.



JOHANN W. DOBEREINER

- Found the atomic mass of strontium atom was similar to the average mass of calcium and barium atoms. These elements had the same chemical properties.
- A similar condition occurred with chlorine, bromine and iodine. The group consisting of these three elements was called triad.
- His classification was limited to several elements only but the classification showed the relationship between the chemical properties of elements and atomic mass.



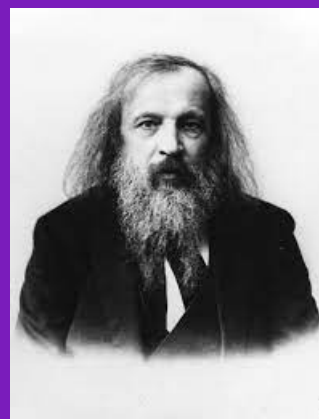
JOHN NEWLANDS

- Arranged elements according to their increasing atomic masses.
- Arranged seven elements in a row because he discovered the chemical and physical properties of the first elements recurred at every eighth element and named as the Law of Octaves that had only been conformed by the first 17 elements
- There were several elements that were classified into the same group but had different chemical properties.
- The recurrence in properties of the eighth element showed the presence of periodic pattern in the properties of elements.



LOTHAR MEYER

- Plotted the graph of atomic volume against atomic mass of elements.
- Discovered the elements at equivalent positions on the curve of the graph had similar chemical properties.
- For example, the alkali metals like lithium, sodium, potassium and rubidium were located at the peaks of the curve.

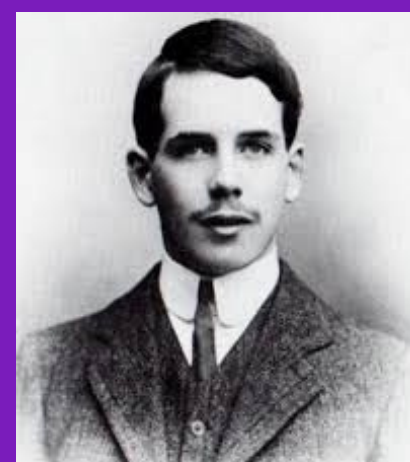


DMITRI MENDELEEV

- Arranged the elements according to their increasing atomic masses.
- Some elements with similar chemicals properties were arranged in the same vertical columns.
- Had left several empty spaces in his periodic table to be filled by elements.
- Successful in predicting the properties of undiscovered elements.

HENRY MOSELEY

- Studied the frequencies of X-ray and found a relationship between X-ray spectrum and proton numbers.
- Proposed each element ought to have its own proto numbers.
- Arranged the elements in Periodic Table of Elements according to their increasing proton numbers.
- Left empty spaces in his periodic table and successfully predicted four elements like technetium, promethium, hafnium, rhenium that were discovered later.



THE DEVELOPMENT OF PERIODIC TABLE



1. Antoine Lavoisier (1743 - 1794)

- Classified element according to gases, non-metals, metals and metal oxides
- Less accurate

2. Johann W. Dobereiner (1780 - 1849)

- Found three elements that had the same chemical properties (triads)
- Showed the relationship between chemical properties of elements and atomic mass.



3. John Newlands (1837 - 1898)

- Arrange elements according to their increasing atomic masses
- Seven elements in a row because the chemical and physical properties of the first element recurred every eight elements (Law of Octaves)
- The law had only been conformed by the 17 elements

4. Lothar Meyer (1830- 1896)

- Plotted the graph of atomic volume against atomic mass of elements
- Found that elements at equivalent positions on the curve of the graph had similar chemical properties
- Recurrence in properties of elements similar to Newlands



5. Dmitri Mendeleev

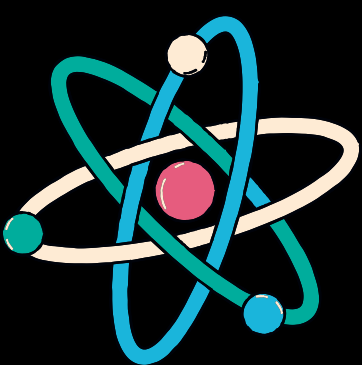
- Arranged the elements according to their increasing atomic masses
- Only elements with similar chemical properties were arranged in the same vertical columns
- Empty spaces in periodic table

6. Henry Moseley

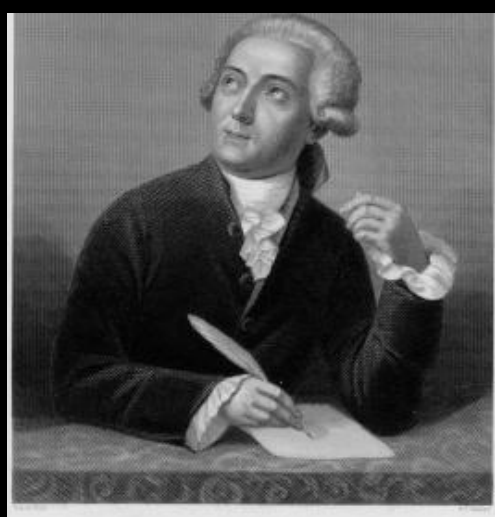
- Found relationship between the X-ray spectrum and proton numbers.
- Arranged the elements in the Periodic Table of Elements according to their increasing of proton numbers.



THE DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS



ANTOINE
LAVOISIER

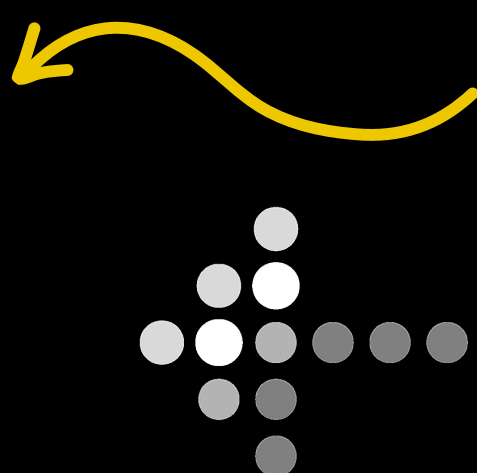
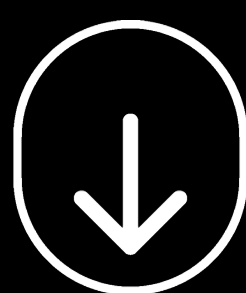


JOHANN
WOLFGANG
DOBEREINER



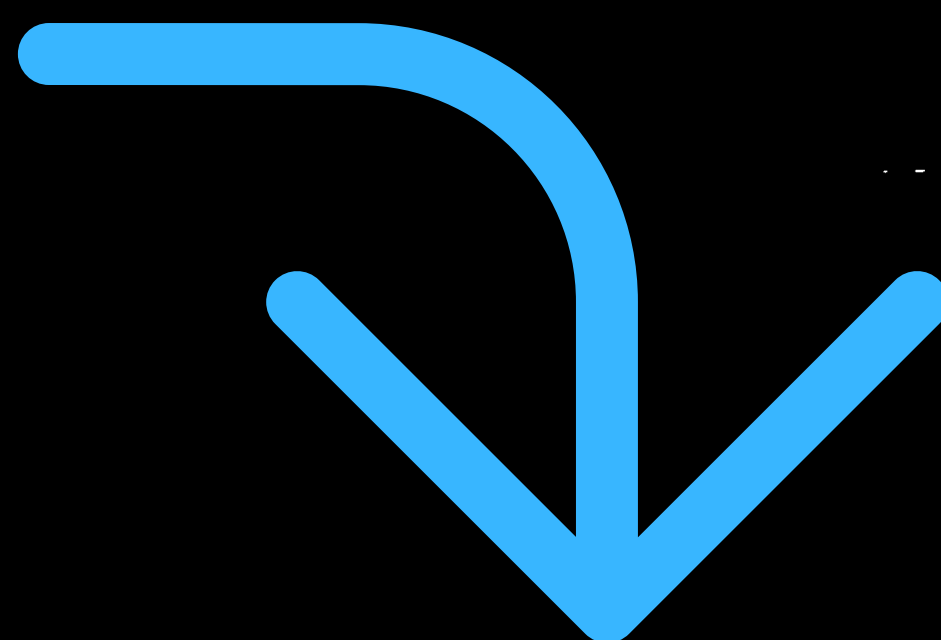
CLASSIFIED ELEMENTS ACCORDING TO CERTAIN GROUPS : { GASES, NON-METALS, METALS AND METAL OXIDES } BUT HIS CLASSIFICATION WAS LESS ACCURATE BECAUSE HE ADDED LIGHT, HEAT AND A FEW COMPOUNDS INTO THE GROUPS AS ELEMENT. HE ALSO WROTE THE FIRST LIST OF 33 ELEMENTS AND DETERMINED THAT COMBUSTION AND RESPIRATION ARE CAUSED BY A CHEMICAL REACTION CALLED "OXYGEN".

JOHN
NEWLANDS

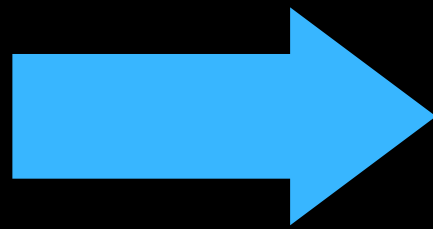


CLASSIFIED THREE ELEMENTS OF THE SAME NATURE INTO A GROUPS OF TRIADS. { LITHIUM, SODIUM AND POTASSIUM FORM A TRIAD }, { CHLORINE, BROMINE AND IODINE FORM A TRIAD }. DOBEREINER'S CLASSIFICATION WAS LIMITED TO SEVERAL ELEMENTS ONLY. HOWEVER HIS CLASSIFICATION SHOWED THE RELATIONSHIP BETWEEN THE CHEMICAL PROPERTIES OF ELEMENTS AND ATOMIC MASS.

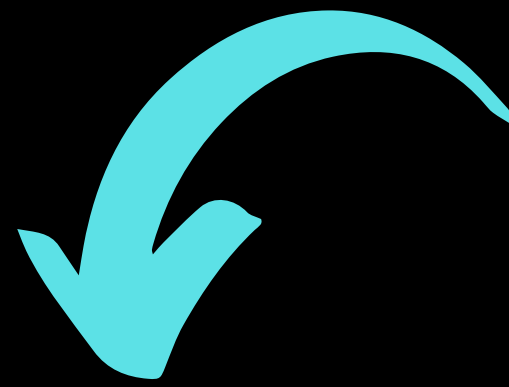
ARRANGED ELEMENTS ACCORDING TO THEIR INCREASING ATOMIC MASSES. ALSO ARRANGED SEVEN ELEMENTS IN A ROW BECAUSE HE FOUND OUT THAT THE CHEMICAL AND PHYSICAL PROPERTIES OF THE FIRST ELEMENT RECCURRED AT EVERY EIGHT ELEMENT. HE NAMED IT { LAW OF OCTAVES }. THIS LAW IS ONLY BEEN CONFIRMED BY THE FIRST 17 ELEMENTS.



LOTHAR
MEYER

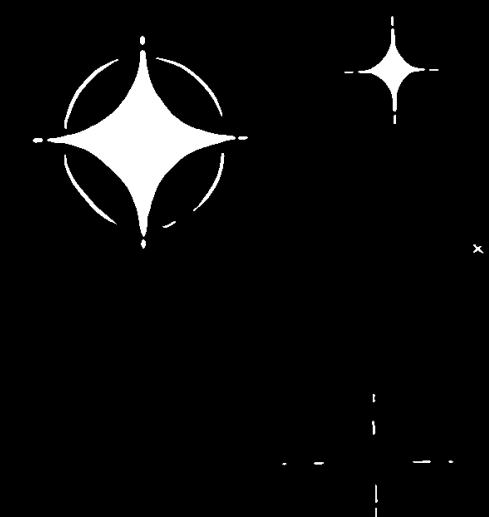


DMITRI
MENDELEEV

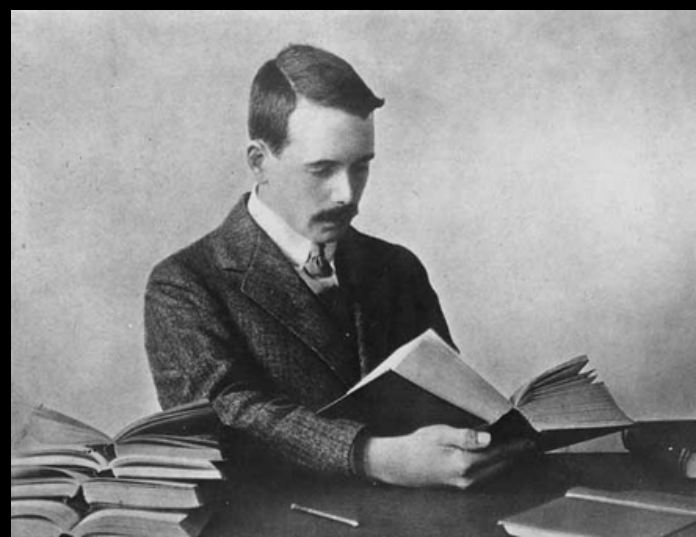


HE ARRANGED 56 ELEMENTS BASED ON THEIR PERIODICAL PROPERTIES SUCH AS THE VOLUME OF ATOM. HE FOUND THAT THE ELEMENTS AT EQUIVALENT POSITIONS ON THE CURVE OF THE GRAPH HAD SIMILAR PROPERTIES. FOR EXAMPLE REFERRING TO THE ALKALI METALS SUCH AS LITHIUM, SODIUM, POTASSIUM AND RUBIDIUM THAT WERE LOCATED AT THE PEAKS OF THE CURVE.

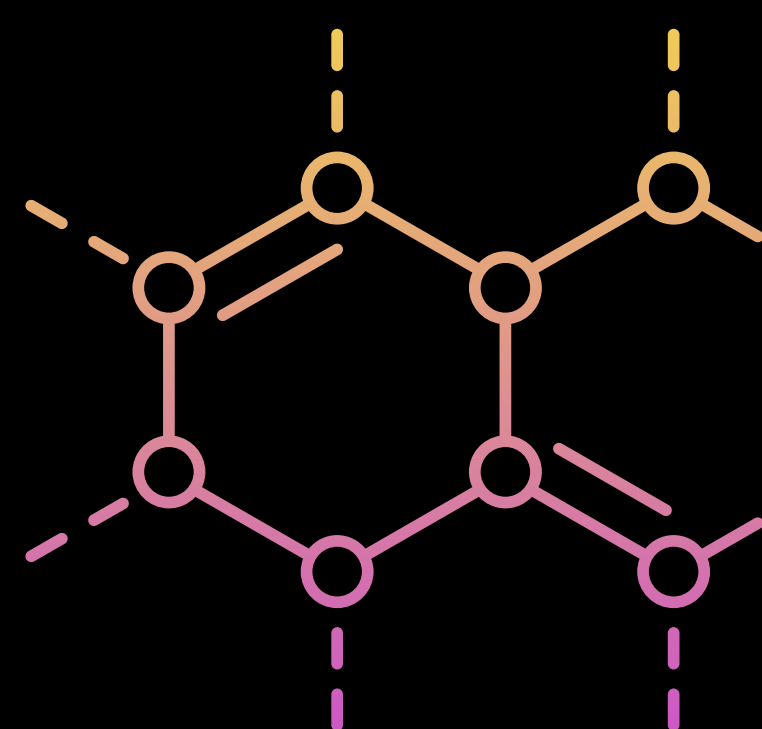
HE ARRANGED THE ELEMENTS ACCORDING TO THE ORDER OF INCREASING ATOMIC MASS. HE LEFT EMPTY SPACES FOR THE ELEMENTS WHICH YET HAVEN'T BEEN DISCOVERED AT THAT TIME. THE ELEMENTS WITH THE SIMILAR CHEMICAL PROPERTIES ARE GROUPED TOGETHER (SAME VERTICAL COLUMNS). HE ALSO PREDICTED THE PROPERTIES OF UNKNOWN ELEMENTS AT THAT TIME WHICH IS PROVEN TRUE LATER ON.



HENRY MOSELEY



MOSELEY STUDIED THE FREQUENCIES OF X-RAY RELEASED BY VARIOUS ELEMENTS AND EVENTUALLY FOUND A RELATIONSHIP BETWEEN THE X-RAY SPECTRUM AND PROTON NUMBER. HE ARRANGED THE ELEMENTS IN THE PERIODIC TABLE OF ELEMENTS ACCORDING TO THEIR INCREASING PROTON NUMBERS. MOSELEY ALSO LEFT EMPTY SPACES IN HIS PERIODIC TABLE AND SUCCESSFULLY PREDICTED FOUR ELEMENTS WHICH ARE TECHNETIUM, Tc, PROMETHIUM, Pm, HAFNIUM, Hf AND RHENIUM, Re.





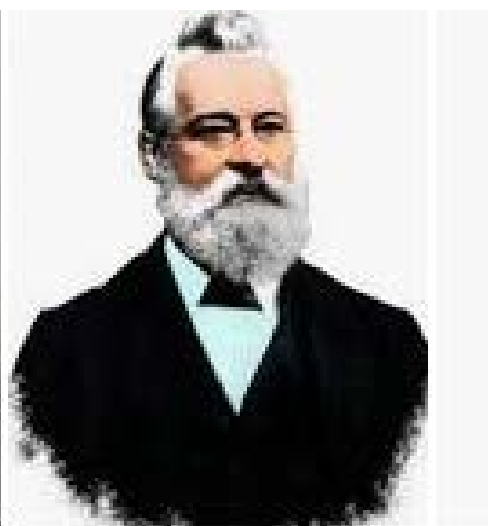
Antoine Lavoisier
(1743-1794)

Classified elements into groups
but also classified non metals into
groups



Johann Dobereiner
(1780-1849)

Discovered triads
Classified and showed relationships
between chemical property and atomic
mass



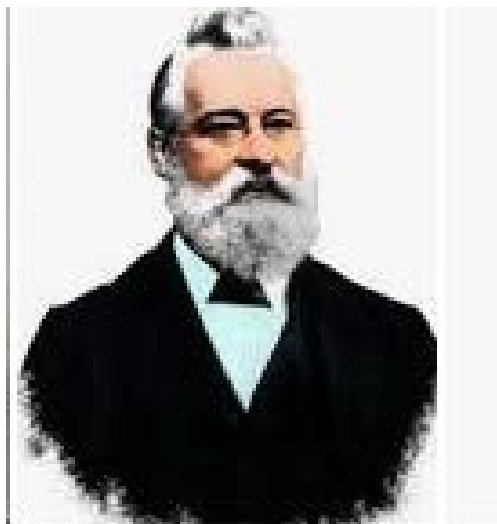
Lothar Meyer
(1830-1895)

Plotted a graph of atomic volume
Elements with equivalent positions had
the same chemical properties



Dmitri Mendeleev
(1834-1907)

Arranged according to
increasing atomic masses
(1834-1907)



John Newlands
(1837-1898)

Introduced the Law of Octaves
only has been confirmed for the first 17
elements



Henry Moseley
(1887-1915)

Found relationship between X-ray
spectrum and proton numbers
Left empty spaces in the Table
Predicted 4 elements successfully

DEVELOPMENT OF PERIODIC TABLE

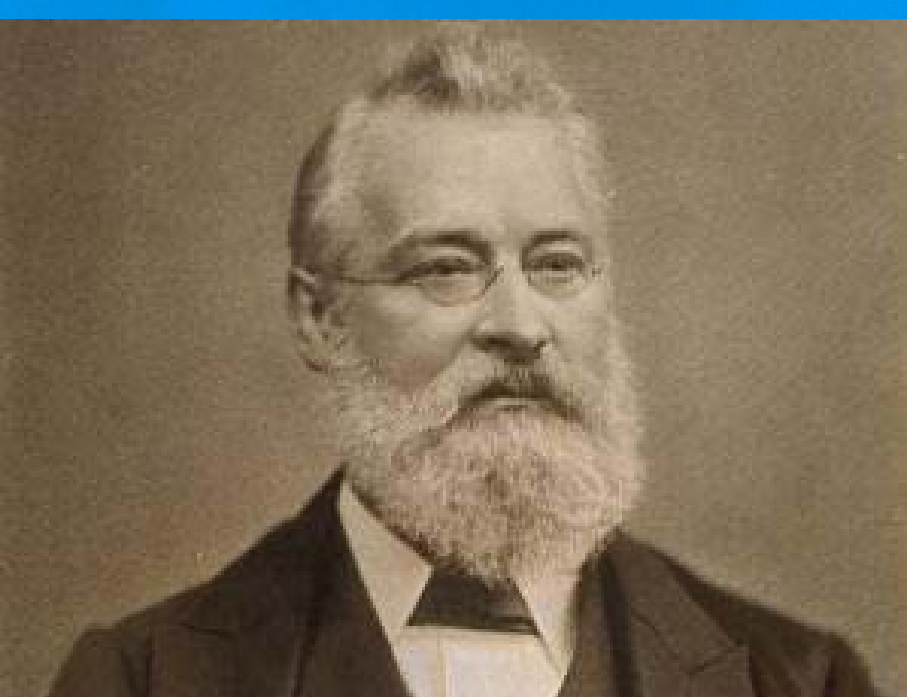
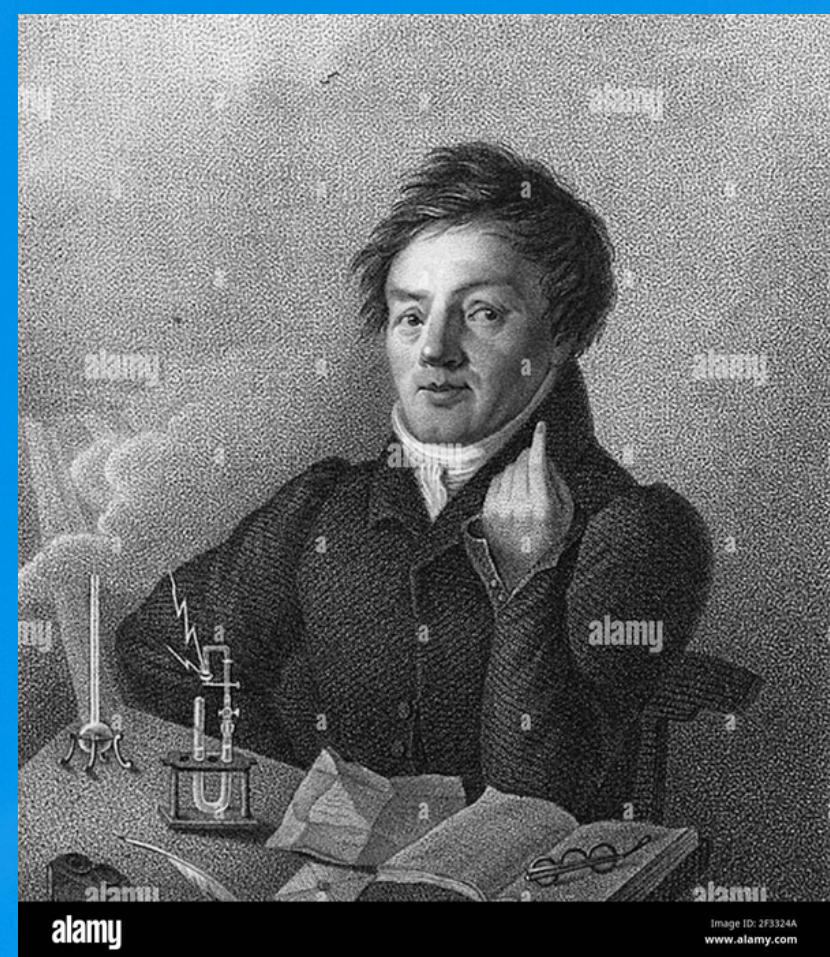


1. ANTOINE LAVOISIER (1743 - 1794)

- Classified metals according to gasses, non-metals, metals and metal oxides
- Less accurate

2. JOHANN W. DOBEREINER (1780 - 1849)

- The group consisting of chlorine, Cl, bromine, Br and iodine, I was named "TRIAD"
- Classification was limited to several element only
- Classification showed the relationship between the chemical properties of elements and atomic mass.



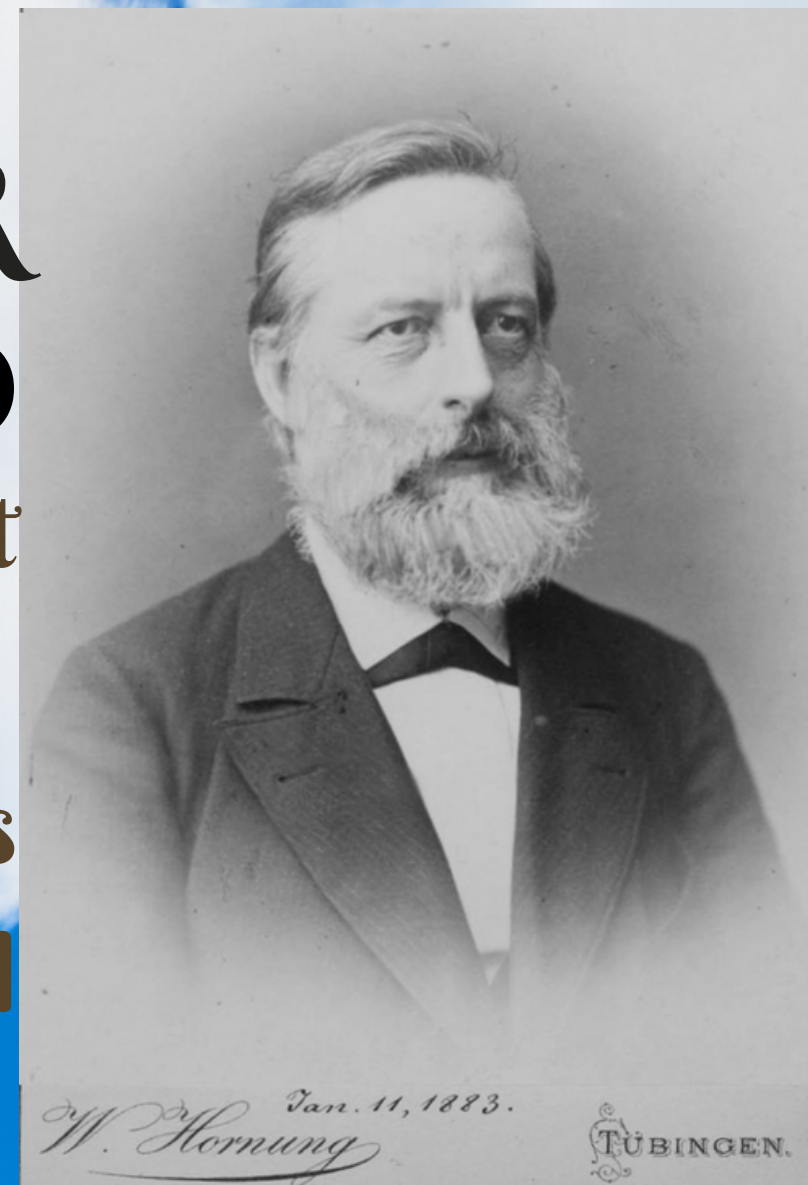
3. JOHN NEWLANDS (1837 - 1898)

- Arranged elements according to their increasing atomic masses.
- Arranged 7 elements in a row because he found that the chemical and physical properties of the first element recurred at every eighth element .
- Named the arrangement "Law of Octaves"
- The law had only been confirmed by the first 17 elements

4. LOTHAR MEYER

(1830 - 1895)

- Plotted the graph of atomic volume against atomic mass of elements
- Found that the elements at equivalent positions on the curve of the graph had similar chemical properties



5. DIMITRI MENDELEEV

(1834 - 1907)

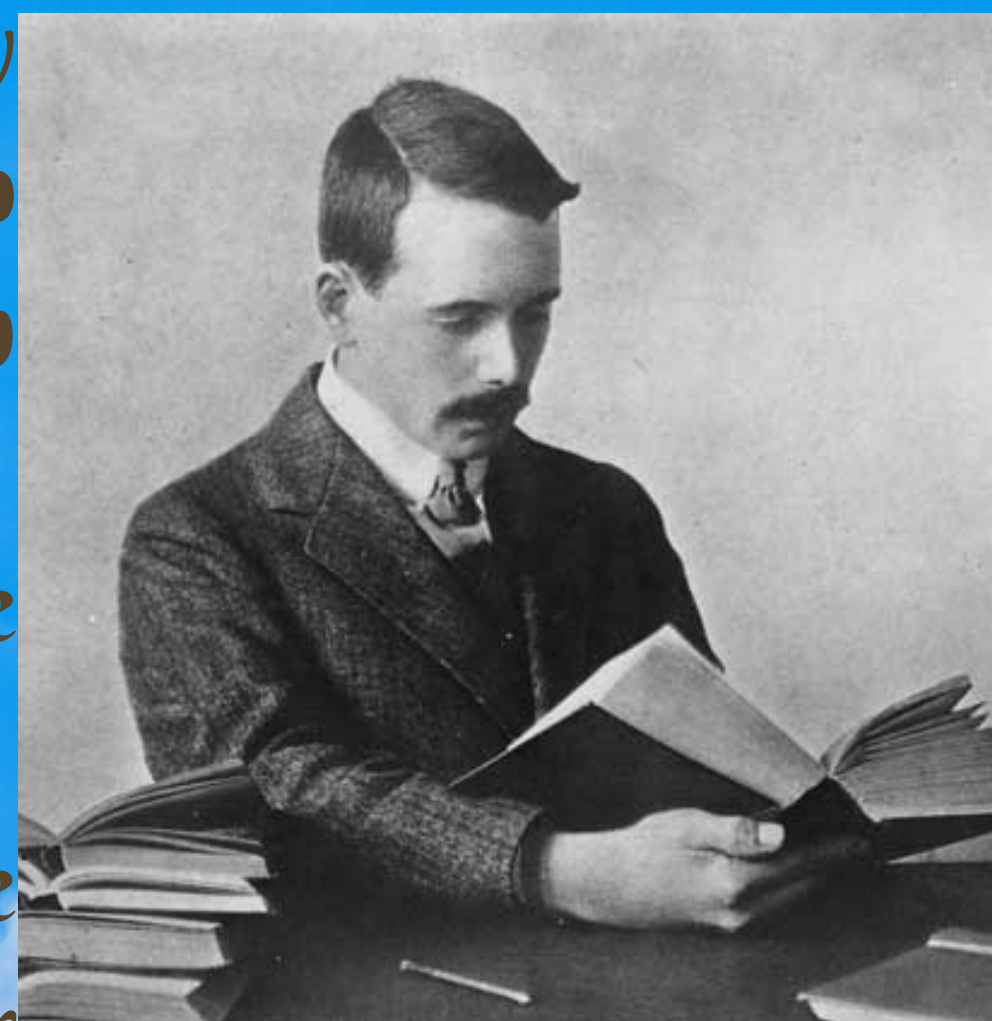
- Arranged the elements according to their increasing atomic masses
- Only elements with similar chemical properties were arranged in the same vertical columns
- Successful in predicting the properties of undiscovered elements



6. HENRY MOSTLEY

(1887 - 1915)

- Studied the frequencies of X-ray released by various elements and found a relationship between the X-ray spectrum and proton numbers
- Arranged the elements in the periodic table according to their increasing proton numbers
- Left empty spaces in his periodic table like Mendeleev and successfully predicted four elements, namely technetium, Tc, promethium, Pm, hafnium, Hf, and rhenium, Re



THE DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

1

Antoine Lavoisier
(1743–1794)

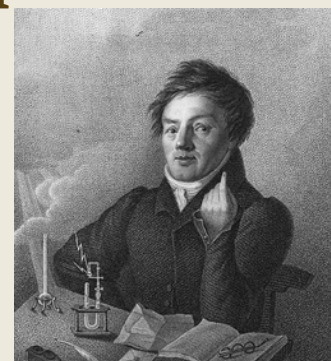


- Classified elements according to groups such as gasses, non-metals, metals and metal oxides.
- Less accurate because consists of heat and a few compounds into the groups as elements and several elements that has different properties classified into same group

Johann W. Dobereiner
(1780–1849)

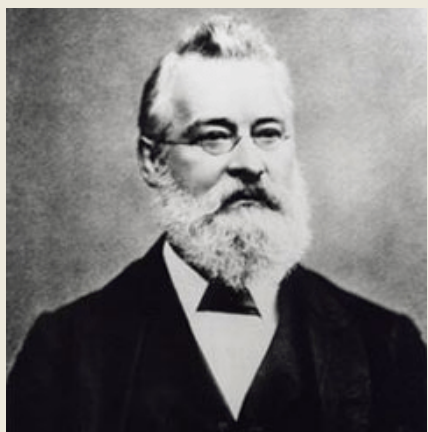
2

- Found the atomic mass of strontium was similar to average mass of calcium and barium
- A similar condition occurred with chlorine, bromine and iodine known as triad
- His classification was limited to several elements only



3

John Newlands
(1837–1898)



- Arranged elements according to their increasing atomic masses
- Arranged seven elements in a row because he found that the chemical and physical properties of the first element recurred at every eight element
- He named the arrangement the Law of Octaves.

Lothar Meyer
(1830–1895)

4

- Plotted the graph of atomic volume against atomic mass of elements.
- Found that the elements at equivalent positions on the curve of the graph had similar chemical properties
- Also prove the recurrence in properties of elements similar to Newlands



5

Dmitri Mendeleev
(1834–1907)



- Arranged elements according to their increasing atomic masses.
- Only elements with similar chemical properties were arranged in the same vertical columns.
- Successful in predicting the properties of undiscovered elements.

Henry Moseley
(1887–1915)

6

- Studied the frequencies of X-ray released by various elements.
- Proposed that each element ought to have its own proton number.
- Arranged the elements in the Periodic Table of Elements according to their increasing proton numbers.
- Also left spaces in periodic table.



DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

1) ANTOINE LAVOISIER (1743-1794)



–classified elements according to certain groups such as gases, non-metals, metals and metal oxides.

–However, his classification was less accurate because he also classified light, heat and a few compounds into the group as elements

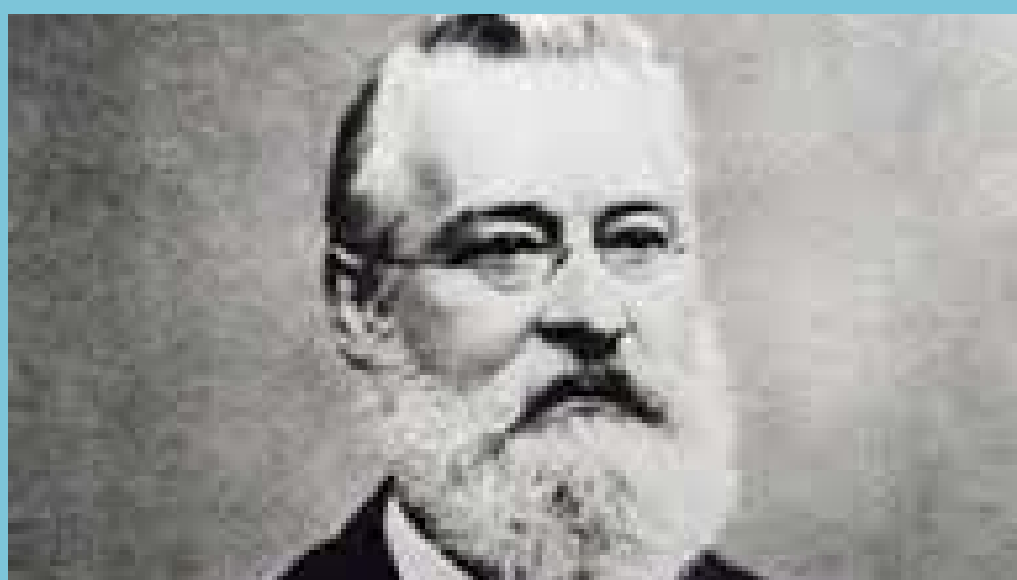
2) JOHANN W. DOBEREINER (1780-1849)



- classified three elements of the same nature into a group known as **triads**
- Proposed that the **RAM for the second element** in a triad is the **average of the RAM of the first and third elements of the triad**
- However, the arrangement of the three elements is **limited to only a few elements**

DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

3) JOHN NEWLANDS (1837-1898)



- In 1864, he compiled all the elements known at that time in order of **increasing atomic mass**
- The same chemical & physical properties were repeated at every **eighth element**
- Known as the **Law of Octaves**

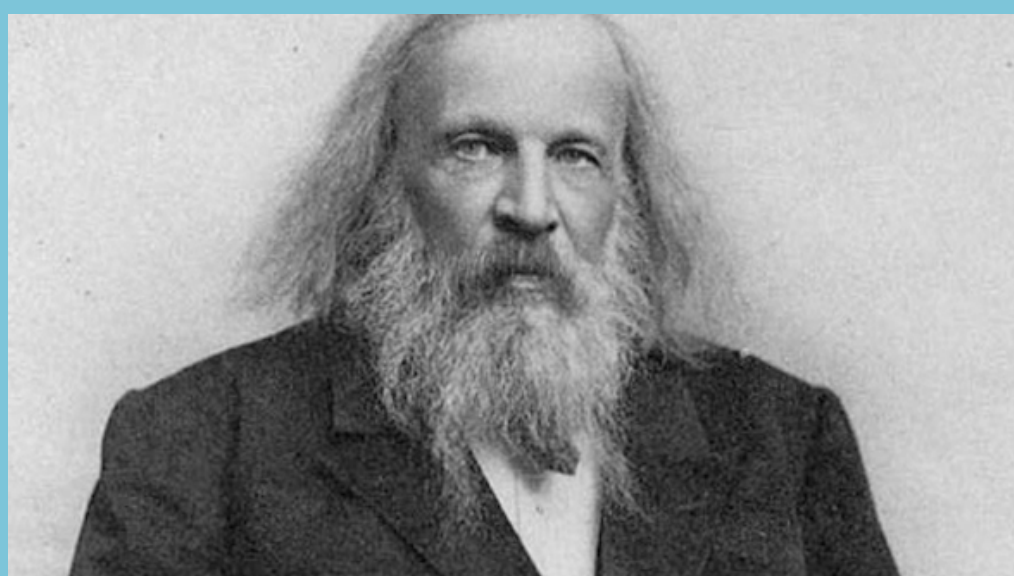
4) LOTHAR MEYER (1830-1895)



- He arranged 56 elements based on their **periodical properties** such as the **volume of atom**
- He found that elements with similar chemical properties occupy a corresponding position on a curve of graph of the volume of atom versus the RAM of the element which he plotted
- He suggested that there is a **periodic relationship of elements based on the RAM**

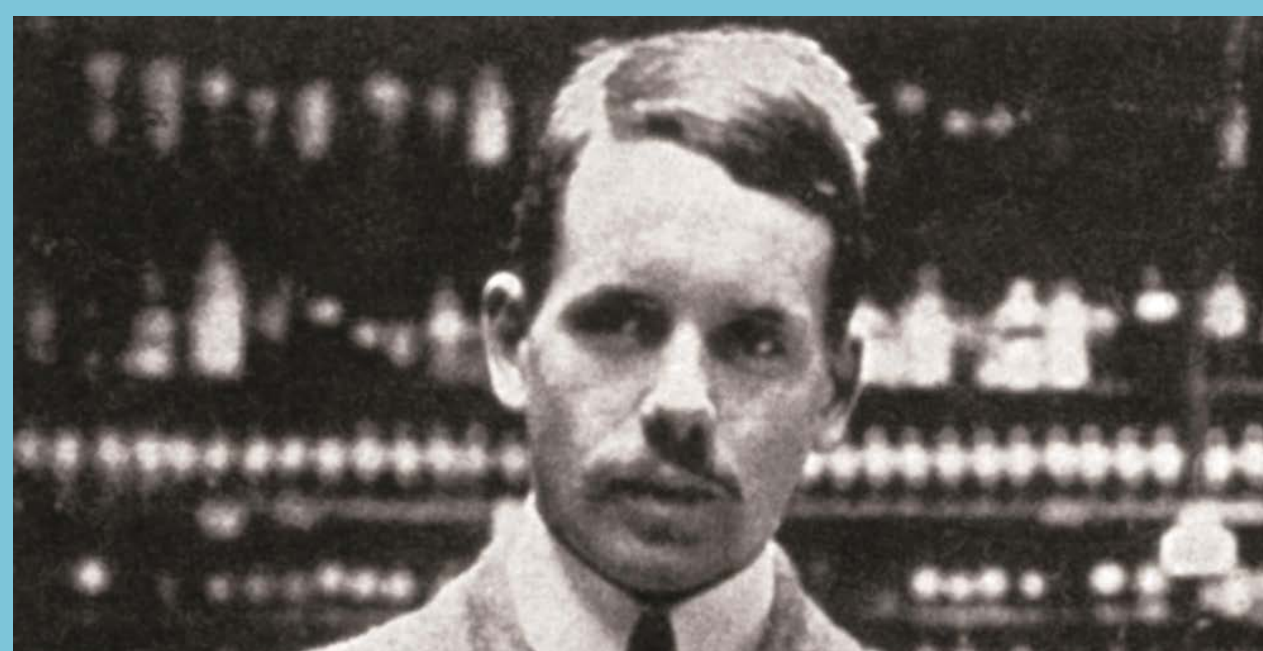
DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

5) DMITRI MENDELEEV (1834-1907)



- He arranged the elements **according to the order of increasing atomic mass**
- He **left empty spaces** for the elements which have yet to be discovered at that time
- The elements with similar chemical properties are grouped together (same vertical columns)
- He predicted the properties of unknown elements at that time, which were later confirmed to be true.

6) HENRY MOSELEY (1887-1915)



- Moseley studied the frequencies of X-ray released by various elements
- He found the **relationship of the X-ray spectrum with the proton number** of each element
- He modernised the Mendeleev Periodic Table by **updating and arranging the elements in order of increasing proton numbers (atomic numbers)** horizontally
- Arranged the elements with the same chemical properties into groups
- The Periodic Table of Elements produced by Moseley became the base for the study of the Modern Periodic Table

The Development of the Periodic Table of Elements

1



ANTOINE LAVOISIER

- Classified elements according to groups such as gases, non-metals, metals and metal oxides.
- Classification is less accurate; classified light and heat as elements, and several elements into the same group despite having different chemical properties.

2



JOHANN W. DOBEREINER

- Found that the atomic mass of Strontium atom was similar to the average mass of Calcium and Barium atoms.
- Found that it is a similar condition between Chlorine, Bromine, and Iodine. This group is called Triad.
- His classification was limited to a few elements only but showed the relationship between chemical properties and atomic mass.

3



JOHN NEWLANDS

- Arranged elements according to their increasing atomic masses.
- Arranged seven elements in a row because the chemical and physical properties of the first element recurred at every 8th element. Named this as the Law of Octaves.
- Law of Octaves has only the first 17 elements. The recurrence in properties of the eight element showed the presence of periodic patterns.

4



LOTHAR MEYER

- Plotted the graph of atomic volume against atomic mass of elements. Found that elements at equivalent positions on the graph had similar chemical properties.
- For example, alkali metals like lithium and sodium were located at the peaks of the curve on the graph.

5



DMITRI MENDELEEV

- Arranged elements according to their increasing atomic masses.
- Elements with similar chemical properties were arranged in the same vertical column
- Successful in predicting undiscovered elements and left several empty spaces to be filled in.

6



HENRY MOSELEY

- Studied the frequencies of X-ray released by elements and found a relationship between the X-ray spectrum and proton numbers.
- Proposed that each element has its own proton number.
- Arranged the elements by the increasing proton numbers.
- Successfully predicted undiscovered elements like Technetium and Promethium as well as left empty spaces like Mendeleev.

the development of the periodic table of elements



chemist:

development

ANTOINE LAVOISIER
(1743-1794)



Classified elements according to groups such as gasses, non metals, metals and metal oxides.

Less accurate because consists of heat and a few compounds into the groups as elements and several elements that has different properties classified into same group

JOHANN W. DOBEREINER
(1780-1849)



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A similar condition occurred with chlorine bromine and iodine known as triad

His classification was limited to several elements only

JOHN NEWLANDS
(1780-1849)



Arranged elements according to their increasing atomic masses

Arranged seven elements in a row because he found that the chemical and physical properties of the first element recurred at every eight element

He named the arrangement the Law of Octaves.

LOTHER MEYER
(1830-1895)



Plotted the graph of atomic volume against atomic mass of elements

Found that the elements at equivalent positions on the curve of the graph had similar chemical properties.

Also prove the recurrence in properties of elements similar to Newlands

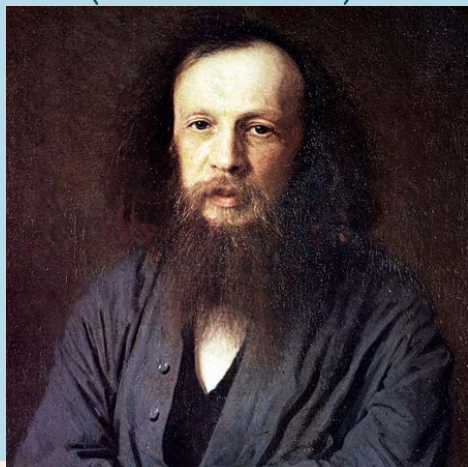
the development of the periodic table of elements



chemist:

development

DMITRI MENDELEEV
(1834-1907)



Arranged elements according to their increasing atomic masses.

Only elements with similar chemical properties were arranged in the same vertical columns.

Successful in predicting the properties of undiscovered elements

HENRY MOSELEY
(1887-1915)



Studied the frequencies of X-ray released by various elements.

Proposed that each element ought to have its own proton number.

Arranged the elements in the Periodic Table of Elements according to their increasing proton numbers.

Also left spaces in periodic table.



THE DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

01

Antoine Lavoisier
(1743-1794)

- Classified elements according to groups such as gasses, non-metals, metals and metal oxides.
- Less accurate because consists of heat and a few compounds into the groups as elements and several elements that has different properties classified into same group



Johann W. Dobereiner
(1780-1849)

02

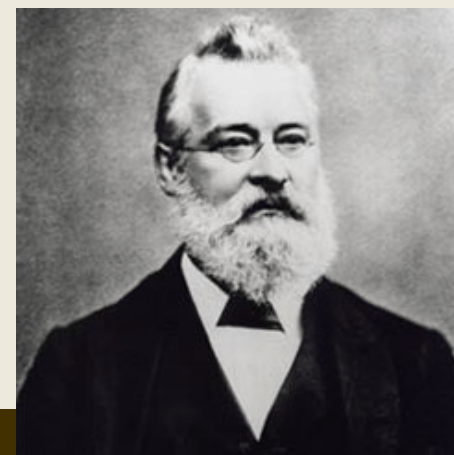


- Found the atomic mass of strontium was similar to average mass of calcium and barium
- A similar condition occurred with chlorine, bromine and iodine known as triad
- His classification was limited to several elements only

03

John Newlands
(1837-1898)

- Arranged elements according to their increasing atomic masses
- Arranged seven elements in a row because he found that the chemical and physical properties of the first element recurred at every eight element
- He named the arrangement the Law of Octaves.



Lothar Meyer
(1830-1895)

04

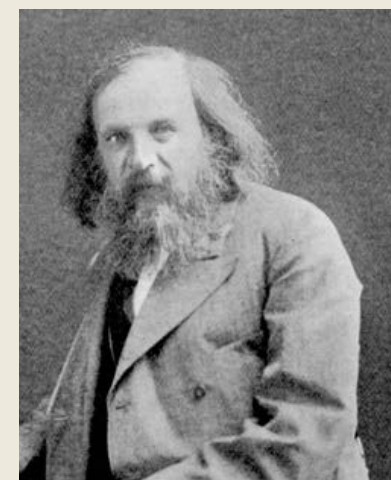


- Plotted the graph of atomic volume against atomic mass of elements.
- Found that the elements at equivalent positions on the curve of the graph had similar chemical properties
- Also prove the recurrence in properties of elements similar to Newlands

05

Dmitri Mendeleev
(1834-1907) Add a heading

- Arranged elements according to their increasing atomic masses.
- Only elements with similar chemical properties were arranged in the same vertical columns.
- Successful in predicting the properties of undiscovered elements.



Henry Moseley
(1887-1915)

06



- Studied the frequencies of X-ray released by various elements.
- Proposed that each element ought to have its own proton number.
- Arranged the elements in the Periodic Table of Elements according to their increasing proton numbers.
- Also left spaces in periodic table.

THE DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

The PERIODIC TABLE OF ELEMENTS classifies known chemical elements in a table according to certain characteristics. Many theories were explained by scientists before this modern table produced. What were those theories? Who were those scientists?

Antoine Lavoisier

- ♥ made the first attempt to arrange the elements.
- ♥ classified elements to certain groups of gases, non-metals, metals and metal oxides.
- ♥ classification was less accurate.



Johann W. Dobereiner

- ♥ found the triad elements.
- ♥ classification was limited to several elements only.
- ♥ classification showed relationship between the chemical properties of elements and atomic mass.



John Newlands

- ♥ arranged elements according to their increasing atomic mass.
- ♥ arrange 7 elements in a row and named it as Law of Octaves.
- ♥ the law only confirmed by the first 17 elements.
- ♥ recurrence in properties of the eighth element showed the presence of periodic pattern.



Lothar Meyer

- ♥ plotted the graph of atomic volume against atomic mass of elements.
- ♥ found the elements at equivalent positions of the graph's curve had similar chemical properties.
- ♥ proved the recurrence in properties of elements similar to Newlands.



Dimitri Mendeleev

- ♥ arranged elements according to their increasing atomic masses with similar chemical properties in the same vertical columns.
- ♥ left gaps for undiscovered elements.
- ♥ successfully predicting the properties of undiscovered elements based on the properties of elements above and below



Henry Moseley

- ♥ studied frequencies of X-ray released by various elements and found relationship between X-ray spectrum and proton numbers.
- ♥ arranged elements according to their increasing proton numbers.
- ♥ left gaps like Mendeleev
- ♥ successfully predicting 4 elements: technetium, Tc ; promethium, Pm ; hafnium, Hf ; rhenium, Re (discovered later)



The Development of the Periodic Table of Elements



Johann W. Dobereiner

- Arranged elements into groups called triad.
- Classification showed the relationship between the chemical properties of elements and atomic mass:
- When the atomic mass of an element is the same as the average mass of another two elements, these elements have same chemical properties.



Lothar Meyer

- Plotted the graph of atomic volume against atomic mass of elements.
- Found that the elements at the same position on the graph had similar chemical properties.



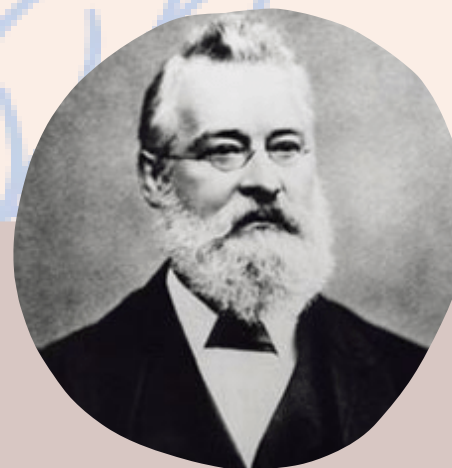
Henry Moseley

- Found a relationship between the X-ray spectrum and proton numbers by studying the frequencies of X-ray released by various elements.
- Arranged elements by increasing proton numbers.
- Left empty spaces in his periodic table.
- Successfully predicted four elements.



Antoine Lavoisier

- Arranged elements such as gases, metals, non-metals and metal oxides into groups.
- Classification was less accurate as he classified light, heat and a few compounds into groups as elements.
- Classified several elements that showed different chemical properties into same group.



John Newlands

- Arranged elements by increasing atomic mass.
- Created the Law of Octaves; the properties of every eighth element starting from any element are a repetition of the properties of the starting element.
- The Law of Octaves had only been conformed by the first 17 elements.



Dmitri Mendeleev

- Arranged elements by increasing atomic mass.
- Arranged elements with similar chemical properties in the same vertical columns.
- Left empty spaces in his periodic table for undiscovered elements with properties which were successfully predicted.

1

2

3

4

5

6

DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENTS

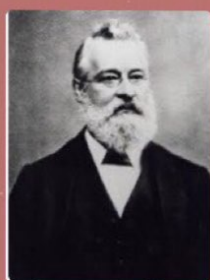


Antoine Lavoisier (1743-1794)

Grouped the elements into four groups which are gases, non-metals, metals and metal oxides

Johann W. Dobereiner (1780-1849)

Developed triads (groups of three elements with similar chemical properties)

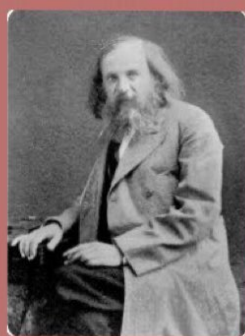
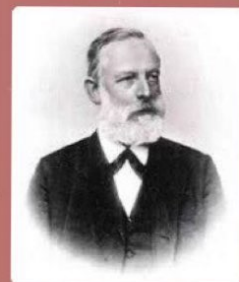


John Newlands (1837-1898)

Proposed the Law of Octaves, where 7 elements are arranged in a row. The elements are arranged according to their increasing atomic masses.

Lothar Meyer (1830-1895)

Plotted the graph of atomic volume against the atomic mass of elements.



Dmitri Mendeleev (1834-1907)

The elements are arranged according to their increasing atomic masses and the elements with similar chemical properties are arranged in the same vertical columns.

Henry Moseley (1887-1915)

Classified the elements based on the concept of proton number and arranged the elements in increasing order of proton numbers.



Selestia - 4 DLP

Periodic Table Of Elements

Development

JOHANN W.

DOBEREIN



- ♥ Arranged elements into groups called triad.
- ♥ Classification showed the relationship between the chemical properties of elements and atomic mass:

When the atomic mass of an element is the same as the average mass of another two elements, these elements have same chemical properties

LOTHAR

MEYER



Plotted the graph of atomic volume against atomic mass of elements.

Found that the elements at the same position on the graph had similar chemical properties

HENRY

MOSELEY



Found a relationship between the X-ray spectrum and proton numbers by studying the frequencies of X-ray released by various elements.

Arranged elements by increasing proton numbers.

Left empty spaces in his periodic table. Successfully predicted four elements.

1

♥ Arranged elements such as gases, metals, non-metals and metal oxides into groups.

♥ Classification was less accurate as he classified light, heat and a few compounds into groups as elements.

♥ Classified several elements that showed different chemical properties into same group.



LAVOSIER

ANTOINE

2

3

Arranged elements by increasing atomic mass

Created the Law of Octaves; the properties of every eighth element starting from any element are a repetition of the properties of the starting element.

The Law of Octaves had only been confirmed by the first 17 elements



NEWLANDS

JOHN

4

5

Arranged elements by increasing atomic mass.

Arranged elements with similar chemical properties in the same vertical columns.

Left empty spaces in his periodic table for undiscovered elements with properties which were successfully predicted



MENDEL EEV

DMITRI

6

PERIODIC TABLE OF ELEMENTS

Modern periodic table showing elements arranged by atomic number, with color-coded groups and labeled sections.



DEVELOPEMENT OF THE PERIODIC TABLE TIMELINE

— *Antoine Lavoisier (1743-1794)*

— *Johann Dobereiner (1780-1849)*

— *John Newlands (1837-1898)*

— *Lothar Meyer (1830-1895)*

— *Dmitri Mendeleev (1834-1907)*

— *Henry Moseley (1887-1895)*



Antoine Lavoisier

- Classified elements according to **gases, non-metals, metals and metal oxide**. However, his classification was less accurate



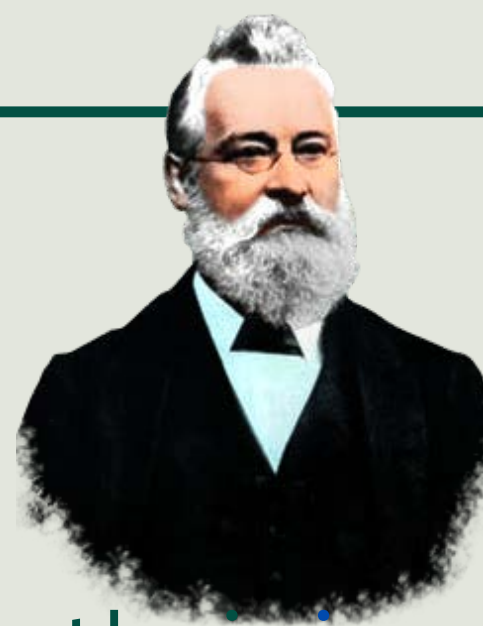
Johann Dobereiner

- Classification showed the relationship between the **chemical properties of elements and atomic mass**





John Newlands



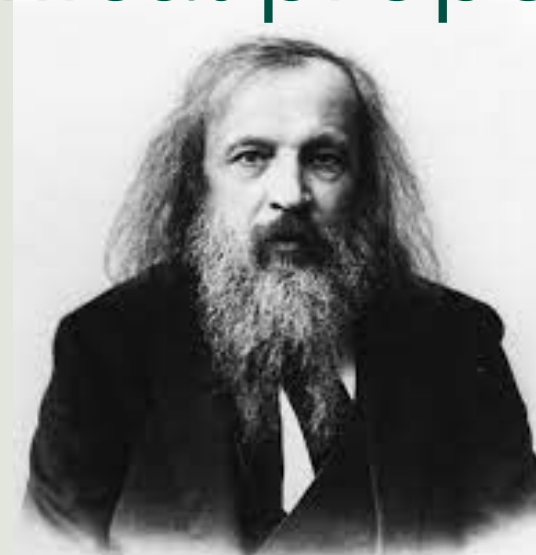
- Classified elements according to their increasing atomic mass
- Arranged 7 in a row because the chemical and physical properties of the 1st element recurred at the 8th element. (Law of Octaves)



Lothar Meyer

- Plotted graph of atomic volume against atomic mass of elements and found that elements at the same positions had the same chemical properties

Dmitri Mendeleev



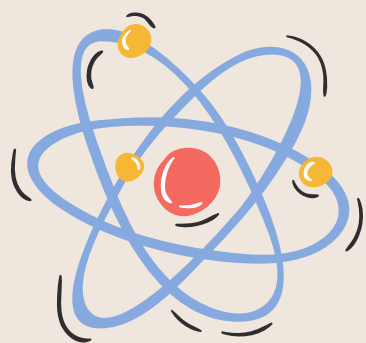
- Arranged elements according to increasing atomic mass. Elements with similar chemical properties were arranged vertically



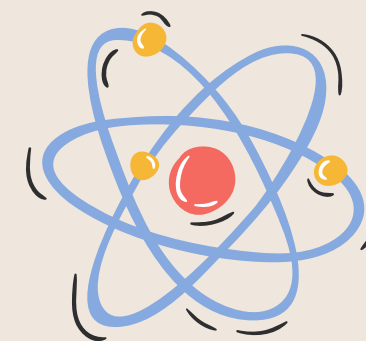
Henry Moseley

- Found the relationship between the X-ray spectrum and proton numbers. He arranged the elements according to increasing proton number



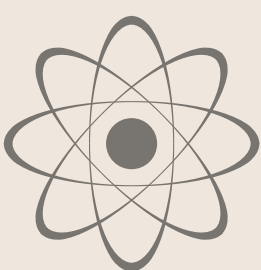
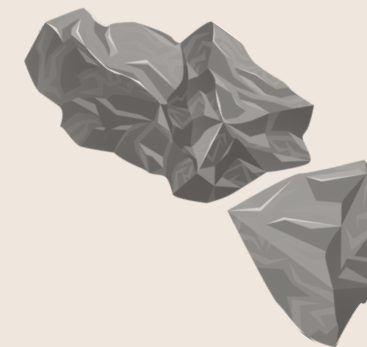


THE DEVELOPMENT OF THE PERIODIC TABLE OF ELEMENT



01 ANTOINE LAVOISIER

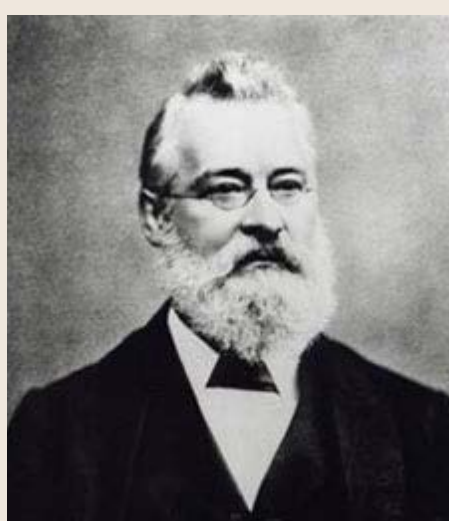
- Elements were grouped into four based on similar chemical properties
- The groups are gases, metal, non-metal and metal oxides
- He also included light, heat and several compounds as elements



02 JOHANN W. DOBEREINER

LAW OF TRIADS

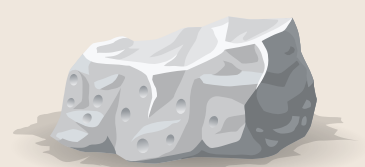
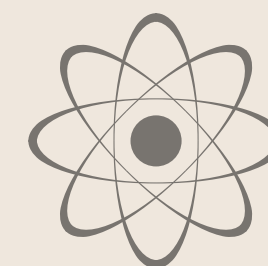
- Elements were divided into groups of three that have the same chemical properties known as triads
- The atomic mass of the middle element is approximately the average atomic mass of the other two elements in the triads



03 JOHN NEWLANDS

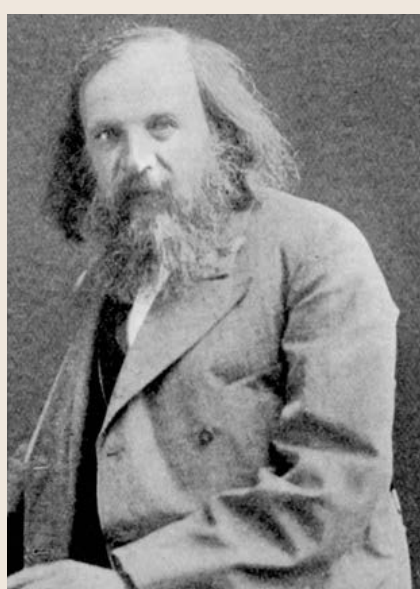
LAW OF OCTAVES

- Elements were arranged in ascending order of atomic mass
- The law of octaves was proposed because the same properties recur in every eighth element in the table
- However, his law is only followed by the first 17 elements



04 LOTHAR MEYER

- He plotted the graph of the atomic volume against the atomic mass of elements
- It is found that the elements occupying corresponding positions on the curve show similar chemical properties



05 DMITRI MENDELEEV

- Elements were arranged in ascending order of atomic mass
- Elements with the same chemical properties were grouped in the same column
- Although the elements were arranged according to the atomic mass, the order was changed if the chemical properties of the element do not match the group
- Empty spaces were left for elements that had yet to be discovered
- The existence and properties of unknown elements were able to be predicted (eka-aluminium, eka-boron, eka-silicon)

06 HENRY G.J. MOSELEY

- Elements were arranged in ascending order of atomic number (proton number)
- The proton number of atoms was able to be measured with X-ray
- The existence of four undiscovered elements was predicted from the proton numbers

