Topic 2 – Atomic Structure

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| **Learning Intention**We are learning how the Periodic Table is organised and how it is used to predict properties of elements  |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 1 | I can explain what an element is and can identify it from its symbol. |  |  |  |  |
| 2 | I can explain what a period and a group are in the periodic table |  |  |  |  |
| 3 | I can name groups 1, 2, 7, 8 of the periodic table and the name of the middle block. |  |  |  |  |
| 4 | I can give some of the properties and uses of groups 1, 2, 7, 8 and the middle block elements |  |  |  |  |
| **Learning Intention**We are learning the basic structure of the atom and how to draw this for different atoms. |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 5 | I can recall the names of the three sub-atomic particles in an atom. |  |  |  |  |
| 6 | I can give the mass, charge and location of the three sub-atomic particles |  |  |  |  |
| 7 | I can identify the mass number and atomic number from an element symbol |  |  |  |  |
| 8 | I can calculate the number of each type of sub-atomic particles in an atom from the mass number and atomic number |  |  |  |  |
| 9 | I can state and draw the electron arrangement for a given element. |  |  |  |  |
| 10 | I know what the group number and period number mean in terms of electron arrangement. |  |  |  |  |
| 11 | I can work out the electron arrangement for an atom from its position in the periodic table. |  |  |  |  |
| 12 | I can explain how ions are formed. |  |  |  |  |
| 13 | I can work out the number of each sub-atomic particle in an ion from its symbol, atomic number and mass number. |  |  |  |  |
| **Learning Intention**We are learning about the role of the nucleus in chemistry. |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 14 | I know why elements give out radiation |  |  |  |  |
| 15 | I know what an isotope is |  |  |  |  |
| 16 | I can explain what RAM is |  |  |  |  |
| 17 | I can calculate the RAM for an element based on given data |  |  |  |  |

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| **Learning Intention**We are learning about the nature of nuclear radiation. |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 18 | I know the names and symbols of the three main types of radiation that atoms can give out. |  |  |  |  |
| 19 | I can describe the properties of the alpha particle |  |  |  |  |
| 20 | I can describe the properties of the beta particle |  |  |  |  |
| 21 | I can describe the properties of gamma rays. |  |  |  |  |
| 22 | I can write nuclear equations to show what happens to elements when they give out radiation. |  |  |  |  |

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| **Learning Intention**We are learning about how the current model of the atom developed over time |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 23 | I can explain what the ancient Greeks/ John Dalton contributed to the idea of the atom |  |  |  |  |
| 24 | I can describe J.J. Thomson’s Model of the atom and what experimental evidence he used to develop it. |  |  |  |  |
| 25 | I can describe Rutherford’s Model of the atom and what experimental evidence he used to develop it. |  |  |  |  |
| 26 | I can describe Bohr’s Model of the atom. |  |  |  |  |
| 27 | I know what contributions Marie & Pierre Curie and James Chadwick made to the structure of the atom. |  |  |  |  |

**Key Words from Topic 2 – Atomic Structure**

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| **Key Word or Phrase** | **Meaning** |
| Atom |  |
| Nucleus |  |
| Proton |  |
| Neutron |  |
| Electron |  |
| Atomic number |  |
| Mass number |  |
| Ion |  |
| Radioactive |  |
| Alpha |  |
| Beta |  |
| Gamma |  |
| Isotope |  |
| RAM |  |
| Representative elements |  |



1





2



3

4



4. Write the name of the scientist who came up with these models of the atom:





5. Calculate the RAM for lead given this data:

|  |  |
| --- | --- |
| **Isotope** | **% Natural abundance** |
| Pb-204 | 1.4 |
| Pb-206 | 24.1 |
| Pb-207 | 22.1 |
| Pb-208 | 52.4 |

6. Complete the following table:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Ion** | **Atomic Number** | **Mass Number** | **Protons** | **Electrons** | **Neutrons** | **Ion Charge** |
|  | 17 |  |  | 18 | 18 |  |
| 16O2- | 8 |  |  |  |  |  |
|  |  | 23 | 11 |  |  | 1+ |
|  | 12 | 24 |  | 10 |  |  |
|  |  |  |  | 10 | 8 | 3- |

1. Write the symbol (including mass and atomic numbers) for alpha, beta and gamma radiation.
2. Write the nuclear equation for the alpha decay of U-238.