**Number of neutrons =**

**mass number – atomic number**

This is known as the **mass number**. This is the number of **protons and neutrons** added together.





The number of **electrons** is the same as the number of protons in an atom.

This is known as the **atomic number** or **proton number.** This is the number of protons in an atom.

# Task 1

Using your periodic tables fill in the table below with the correct numbers.

**Clue:** Some of the numbers will be the same. If you can work out which numbers they are, it will make filling in the table easier.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Element | Atomic number | Mass number | Number of protons | Number of neutrons | Number of electrons |
| Hydrogen |  |  |  |  |  |
| Helium |  |  |  |  |  |
| Lithium |  |  |  |  |  |
| Beryllium |  |  |  |  |  |
| Boron |  |  |  |  |  |
| Carbon |  |  |  |  |  |
| Nitrogen |  |  |  |  |  |
| Oxygen |  |  |  |  |  |
| Fluorine |  |  |  |  |  |
| Neon |  |  |  |  |  |
| Sodium |  |  |  |  |  |
| Magnesium |  |  |  |  |  |
| Aluminium |  |  |  |  |  |
| Silicon |  |  |  |  |  |
| Phosphorus |  |  |  |  |  |
| Sulfur |  |  |  |  |  |
| Chlorine |  |  |  |  |  |
| Argon |  |  |  |  |  |
| Potassium |  |  |  |  |  |
| Calcium |  |  |  |  |  |

# Task 2

Answer the following questions.

1. What is the pattern shown by the atomic numbers of the first 20 elements?

1. Three of the numbers on the table are always the same for each element. Which three numbers are they?

1. There is only one element that has a mass number that is not higher than its atomic number. Which element is it? Use the table to answer this question.

1. Which element has the lowest mass?
2. Name the elements from the table with the same number of protons and neutrons.

1. Look at the elements lithium, sodium, potassium and rubidium in the periodic table. What happens to their atomic numbers as you look down the column?

1. Look at beryllium, magnesium, calcium and strontium. Do their atomic numbers change in the same way as the elements in question 3?

1. Name these elements (P = protons, N = neutrons, small dots = electrons). Explain how you named these elements.

|  |  |  |
| --- | --- | --- |
| **Element A** | **Element B** | **Element C** |
| 11P12N | 9P10N | **N****N****P****P** |
|     |     |     |

1. Name these elements using the diagrams. Explain how you named these elements. (Hint: The dots on circles are electrons. The number of protons and neutrons are not shown.)

|  |  |  |
| --- | --- | --- |
| **Element A** | **Element B** | **Element C** |
|  |  |  |
|     |     |     |

1. How many neutrons do these atoms have? Explain how you worked this out.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Element A** | **Element B** | **Element C** | **Element D** | **Element E** |
|  |  |  |  |  |
| Number of neutrons |
|  |  |  |  |  |
|      |