

Symbols and formulas

Learning objectives

- 1 Understand why chemists communicate using symbols and formulas.
- 2 Use the periodic table to find the symbols for elements.
- 3 Understand how subscript numbers indicate the number of atoms in a formula including where there are brackets present.
- 4 Write independently about symbols and formulas, using provided key words.

Introduction

Chemicals have different names in different languages. If English is your first language, you might recognise sulfuric acid in Romanian, but perhaps you would not recognise it in Polish unless you speak that language.

Polish	kwas siarkowy
Romanian	acid sulfuric

Scientists use symbols and formulas as one way of overcoming language barriers when communicating their science.

Chemical formulas contain chemical symbols (for example, H) and may also have subscript numbers (numbers which are smaller and lower than the letters, for example H₂).

You need to learn the rules of how the symbols and formulas work. This knowledge will be very useful for the rest of your science education.

Instructions

1. Stick the structure strip in the margin of your exercise book/paper.
2. Follow the prompts in the structure strip, and use your knowledge, to write a summary of symbols and formulas:
 - Reflect on what you already know about symbols and formulas.
 - Where have you seen the key words before?
 - If you'd like more support, what other sources could you use to find the information, e.g. a textbook, online?
3. Answer the extension question to apply your knowledge of symbols and formulas to a new context.

Key words

Use these key words in your responses:

- atom • element • chemical symbol • chemical formula

Symbols and formulas	Symbols and formulas	Symbols and formulas	Symbols and formulas	Symbols and formulas
Write three examples of chemical symbols that are a capital letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and write the names of the elements they represent.
Write three examples of chemical symbols that are a capital letter and a lower-case letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and a lower-case letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and a lower-case letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and a lower-case letter and write the names of the elements they represent.	Write three examples of chemical symbols that are a capital letter and a lower-case letter and write the names of the elements they represent.
Oxygen has two forms, O_2 which is in the air we breathe, and O_3 which is called ozone. Explain how the formulas show these are: a) the same element and b) in different forms.	Oxygen has two forms, O_2 which is in the air we breathe, and O_3 which is called ozone. Explain how the formulas show these are: a) the same element and b) in different forms.	Oxygen has two forms, O_2 which is in the air we breathe, and O_3 which is called ozone. Explain how the formulas show these are: a) the same element and b) in different forms.	Oxygen has two forms, O_2 which is in the air we breathe, and O_3 which is called ozone. Explain how the formulas show these are: a) the same element and b) in different forms.	Oxygen has two forms, O_2 which is in the air we breathe, and O_3 which is called ozone. Explain how the formulas show these are: a) the same element and b) in different forms.
Using CaF_2 , explain how to use subscript numbers in formulas to work out the number of each atom.	Using CaF_2 , explain how to use subscript numbers in formulas to work out the number of each atom.	Using CaF_2 , explain how to use subscript numbers in formulas to work out the number of each atom.	Using CaF_2 , explain how to use subscript numbers in formulas to work out the number of each atom.	Using CaF_2 , explain how to use subscript numbers in formulas to work out the number of each atom.
Using $Mg(OH)_2$, explain how to work out the number of atoms of an element in a formula when there are brackets present.	Using $Mg(OH)_2$, explain how to work out the number of atoms of an element in a formula when there are brackets present.	Using $Mg(OH)_2$, explain how to work out the number of atoms of an element in a formula when there are brackets present.	Using $Mg(OH)_2$, explain how to work out the number of atoms of an element in a formula when there are brackets present.	Using $Mg(OH)_2$, explain how to work out the number of atoms of an element in a formula when there are brackets present.

Extension question

Magnesium as an element has the chemical symbol Mg. Two of its compounds – magnesium oxide and magnesium hydroxide – have the formulas MgO and Mg(OH)₂. Create a poster to explain what information these formulas give.