

# Chemical Symbols and Formulas

---

Ck12 Science

**Say Thanks to the Authors**

Click <http://www.ck12.org/saythanks>

*(No sign in required)*



To access a customizable version of this book, as well as other interactive content, visit [www.ck12.org](http://www.ck12.org)

CK-12 Foundation is a non-profit organization with a mission to reduce the cost of textbook materials for the K-12 market both in the U.S. and worldwide. Using an open-source, collaborative, and web-based compilation model, CK-12 pioneers and promotes the creation and distribution of high-quality, adaptive online textbooks that can be mixed, modified and printed (i.e., the FlexBook® textbooks).

Copyright © 2016 CK-12 Foundation, [www.ck12.org](http://www.ck12.org)

The names “CK-12” and “CK12” and associated logos and the terms “**FlexBook®**” and “**FlexBook Platform®**” (collectively “CK-12 Marks”) are trademarks and service marks of CK-12 Foundation and are protected by federal, state, and international laws.

Any form of reproduction of this book in any format or medium, in whole or in sections must include the referral attribution link <http://www.ck12.org/saythanks> (placed in a visible location) in addition to the following terms.

Except as otherwise noted, all CK-12 Content (including CK-12 Curriculum Material) is made available to Users in accordance with the Creative Commons Attribution-Non-Commercial 3.0 Unported (CC BY-NC 3.0) License (<http://creativecommons.org/licenses/by-nc/3.0/>), as amended and updated by Creative Commons from time to time (the “CC License”), which is incorporated herein by this reference.

Complete terms can be found at <http://www.ck12.org/about/terms-of-use>.

Printed: December 7, 2016

**flexbook**  
next generation textbooks



## CHAPTER

## 1

# Chemical Symbols and Formulas

## Learning Objectives

- Define chemical symbol.
- Define chemical formula.
- Give the Latin name for elements that use the Latin name for their symbol.

How do chess players monitor their moves in a game?

Suppose you were walking along and noticed a piece of paper on the ground with markings on it. You pick it up and see the paper in the picture above. To most people, these notes are meaningless (maybe they're a secret spy code). But to a chess player, these symbols tell the story of a chess game. Each abbreviation describes a chess piece or a move during the game. The use of special symbols allows us to "see" the game without having to read a wordy and possibly incomplete description of what happened.



FIGURE 1.1

Chess game.

## Chemical Symbols and Formulas

In order to illustrate chemical reactions and the elements and **compounds** involved in them, chemists use symbols and formulas. A **chemical symbol** is a one- or two-letter designation of an element. Some examples of chemical symbols are "O" for oxygen, "Zn" for zinc, and "Fe" for iron. The first letter of a symbol is always capitalized. If the symbol contains two letters, the second letter is lower case. The majority of elements have symbols that are based on their English names. However, some of the elements that have been known since ancient times have maintained symbols that are based on their Latin names, as shown in **Table 1.1**.

**TABLE 1.1:** Symbols and Latin Names for Elements

| Chemical Symbol | Name | Latin Name |
|-----------------|------|------------|
|-----------------|------|------------|

TABLE 1.1: (continued)

|    |           |          |
|----|-----------|----------|
| Na | sodium    | natrium  |
| K  | potassium | kalium   |
| Fe | iron      | ferrum   |
| Cu | copper    | cuprum   |
| Ag | silver    | argentum |
| Sn | tin       | stannum  |
| Sb | antimony  | stibium  |
| Au | gold      | aurum    |
| Pb | lead      | plumbum  |

Compounds are combinations of two or more elements. A **chemical formula** is an expression that shows the elements in a compound and the relative proportions of those elements. Water is composed of hydrogen and oxygen in a two to one ratio. The chemical formula for water is  $H_2O$ . Sulfuric acid is one of the most widely produced chemicals in the United States and is composed of the elements hydrogen, sulfur, and oxygen. The chemical formula for sulfuric acid is  $H_2SO_4$ .

#### Summary

- A chemical symbol is a one- or two-letter designation of an element.
- Compounds are combinations of two or more elements.
- A chemical formula is an expression that shows the elements in a compound and the relative proportions of those elements.
- Many elements have symbols that derive from the Latin name for the element.

#### Vocabulary

- **chemical formula:** An expression that shows the elements in a compound and the relative proportions of those elements.
- **chemical symbol:** A one- or two-letter designation of an element.
- **compound:** Are combinations of two or more elements.

---

#### References

1. Roland Scheicher. [http://commons.wikimedia.org/wiki/File:Immortal\\_game.jpg](http://commons.wikimedia.org/wiki/File:Immortal_game.jpg) . Public Domain