

CORE CONCEPTS

# Periodic Table

Digital Resource  
from Rosen  
Publishing

**CORE CONCEPTS**  
**Periodic Table**

ROSEN digital

print email site

Previous A-Z

Sections

- All About Oxygen
- Oxygen the Life-Giving Element
- What is Oxygen?
- Oxygen and Our World
- Oxygen and Combustion
- Oxygen Compounds
- Oxygen and Life
- Resources
- For Further Reading
- Glossary

Related Entries

- Nitrogen
- Barium
- Fluorine
- Sulfur

Element Builder

Educator Resources

## Oxygen

### What is Oxygen?

Take a deep breath. Now, take another. Can you smell the oxygen in the air? Probably not. That's because oxygen is an odorless, tasteless, and colorless element. Elements are made of only one kind of substance, known as an atom. These elements are the building blocks of matter. By thinking about matter as a giant puzzle that creates everything in the universe, elements are the puzzle pieces. By fitting the pieces together in one way, you can create a grain of sand.

It is not enough to say that oxygen is important to life on Earth. You may not be able to see, taste, or touch oxygen, but it is very real and absolutely essential to life in our world. There would be none of the beautiful plants and animals that you see every day because oxygen is vital to nearly every organism on Earth.

In 1775, Scheele discovered oxygen while experimenting with nitric acid, a colorless liquid that can cause severe burns and is often used in fertilizer. When he heated nitric acid, a gas was released that made nearby candles burn brighter. Scheele wrote that the atmosphere is composed of two gases. One supports combustion, or burning, which he called "fire air." The other, which he called "foul air," prevents combustion.

### Karl Scheele

Born on December 8, 1748, Karl Scheele was a well-respected chemist by the time he was thirty years old. Scheele isolated and investigated many chemical compounds, including nitric acid, which is found in fruits such as oranges, grapefruit, lemons, and limes. Scheele also invented many techniques for studying chemical elements and reactions. He was also the first to prove that the same metal may go through different stages as it develops rust.

Nitrogen 78%  
Oxygen 21%  
Other 1%

## Supports STEM & Next Generation Science Science Standards!

Core Concepts: Periodic Table makes complex scientific concepts easy to understand and highly engaging. Its intuitive interactive interface encourages hands-on exploration to develop a deep understanding of the 118 elements that make up our world, immersing learners in the building blocks of each element, their discoveries and uses throughout history, and much more.

## Features include:

- Interactive and engaging interface
- Extensive videos, images, diagrams, and data tables, including student-created video from the Chemical Heritage Foundation
- Interactive activities reinforcing skills and core ideas
- Instant translation into over 50 languages
- Curriculum correlations to Common Core, state, national, and provincial science standards
- Optional text-to-speech and text highlighting
- Lesson plans and instructional materials for educators
- iPad, iPhone, iPod Touch, and Android compatibility

# Homepage

**CORE CONCEPTS**

## Periodic Table

Site Help | Logout ROSEN digital

Browse A-Z | **Element Builder** | Explore, Create, Learn | More About the Periodic Table

Group 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

### Oxygen

Atomic weight: 15.999  
Electron configuration:  $[\text{He}] 2s^2 2p^4$   
State of matter: gas  
Found naturally: yes

Periodic Trends

5 B 6 C 7 N 8 O 9 F 10 Ne  
13 Al 14 Si 15 P 16 S 17 Cl 18 Ar

4 K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br Kr  
5 Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I Xe  
6 Cs Ba 57-71 Hf Ta W Re Os Ir Pt Au Hg Tl Pb Bi Po At Rn  
7 Fr Ra 89-103 Rf Db Sg Bh Hs Mt Ds Rg Cn

57 La 58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu  
89 Ac 90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr

Alkali Metals | Alkaline Earth Metals | Transition Elements | **Other Metals** | Lanthanides and Actinides | Metalloids | Other Nonmetals | Halogens | Noble Gases | Unknown

Metals | Metalloids | Nonmetals

Appealing, friendly interface with prominent search tool

Periodic Trends explains logic of the Periodic Table.

Top navigation bar leads to article browse, interactive activities, and resources for teachers and librarians.

Hover-over elements displays basic element data.

Clicking leads to element's landing page for in-depth information.

Hover-over bottom bar displays elements by type.

# Navigating an article

Table of contents allows students to navigate within an article.

Articles feature “Resources,” “Further Reading,” and “Glossary.”

Print Email Cite this Article

Oxygen

Browse A-Z

Sections

All About Oxygen

Oxygen: The Life-Giving Element

Oxygen?

the Periodic Table

Our World

Oxygen Compounds

Oxygen and Life

Resources

For Further Reading

Glossary

Investigate

Element Builder

Resources for Teachers

## All About Oxygen

8 PROTONS  
8 ELECTRONS

8  
Oxygen

1ST 2  
2ND 6

8 ELECTRONS

Investigate the properties of oxygen with this student-created video. Join the Oxygen News team as they explore how this common element affects our world.

Video from It's Elemental online periodic table. © 2011 Chemical Heritage Foundation

Click the terms on the left for more information.

Symbol	O
Atomic Number	8
Atomic Weight	15.999
Protons	8
Electrons	8
Neutrons	8
Stable Isotopes	$^{16}\text{O}$ , $^{17}\text{O}$ , $^{18}\text{O}$

Element landing pages include diagrams, videos, and extensive element data.

# Navigating an article

 Print  Email  Cite this Article

Browse A-Z

Sections

All About Oxygen

Oxygen: The Life-Giving Element

- Print or email an entire article or an article section.
- Citations can be automatically generated in MLA7 and APA format.
- Investigate related articles.

Resources

For Further Reading

Glossary

Investigate

Barium

Fluorine

Nitrogen

Sulfur



Element Builder

Oxygen

 Listen

« PREVIOUS SECTION

NEXT SECTION »

Select Language

Google Translate

SHARE

- Text-to-speech and instant translation help students read and understand the content.
- Video, photos, diagrams, and data tables demonstrate and reinforce key concepts.

## Oxygen: The Life-Giving Element

On August 20 and again on September 9, 1975, scientists at the National Aeronautics and Space Administration launched two unmanned Mars rovers, *Viking 1* and *Viking 2*. Their mission was to search for signs of life on Mars. After a ten-month journey, the rovers landed and released landers to explore the Martian surface.

*Viking 1* landed at the Utopia Planitia, a similar volcanic plain nearly 4,000 miles (6,500 kilometers) away, with shallow troughs that may have been caused by sheets of ice expanding and receding across the Martian surface. Both of these landers transmitted hundreds of measurements and color photographs back to Earth. Several of their scientific experiments were designed to discover whether there were bacteria living in the soil and to find evidence of oxygen (O), an essential element for life.

While the missions provided many clues about Martian history and taught us that Mars is more like Earth than any other planet in our solar system, scientists never did find what they were looking for—solid evidence that life exists or once existed on Mars.

However, scientists were not discouraged. In early 2004, NASA landed a spacecraft on



This photo, taken by a Mars exploration rover in 2004, shows the lifeless landscape of the Red Planet. For decades, scientists have been debating the existence of oxygen on Mars.

[View Larger Image](#)  
courtesy of NASA

# Navigating an article

All About Oxygen
<b>Oxygen: The Life-Giving Element</b>
What Is Oxygen?
Oxygen and the Periodic Table
Oxygen and Our World
Oxygen and Combustion
Oxygen Compounds
Oxygen and Life

Each page contains links to:

- Interactive Activities
- Resources for Teachers & Librarians

Fluorine
Nitrogen
Sulfur

 **Element Builder**

 **Resources for Teachers and Librarians**

 **Explore, Create, Learn**

## Oxygen: The Life-Giving Element

On August 20 and again on September 9, 1975, scientists at the National Aeronautics and Space Administration (NASA) launched two unmanned spacecraft named *Viking 1* and *Viking 2* into outer space. Their mission was to search for signs of life on Mars. After a ten-month journey, the two spacecraft entered into orbit around Mars and released landers that touched down on July 20 and September 3, 1976.

The element oxygen, which you cannot see, feel, or taste, sustains all life on Earth.

*Viking 1* landed at the Chryse Planitia, a rolling, boulder-strewn plain with scattered dusty dunes and outcrops of bedrock. These rocks are believed to be worn-away remnants of volcanic rock from billions of years ago. *Viking 2* landed at the Utopia Planitia, a similar volcanic plain nearly 4,000 miles (6,500 kilometers) away, with shallow troughs that may have been caused by sheets of ice expanding and receding across the Martian surface. Both of these landers transmitted hundreds of measurements and color photographs back to Earth. Several of their scientific experiments were designed to discover whether there were bacteria. Evidence of oxygen (O), an essential element for life.



This photo, 2004, shows the Martian surface. For the existence of life, View Large courtesy of NASA

While the missions provided many clues about Martian history and taught us that Mars is more like Earth than any other planet in our solar system, scientists never did find what they were looking for—solid evidence that life exists or once existed on Mars.

However, scientists were not discouraged. In early 2004, NASA landed a spacecraft on the Martian surface. This time, the craft returned information giving evidence that water once existed on Mars. Water contains large amounts of oxygen, so life may have existed on Mars.

It is the presence of oxygen here on Earth that gives our planet life. This single element allows us to breathe, gives plants the ability to grow, and helps keep our planet warm. The element oxygen, which you cannot see, feel, or taste, sustains all life on Earth. Oxygen is an important element, one that we cannot live without—literally!

« PREVIOUS SECTION

NEXT SECTION »

Article Citation in MLA (Modern Language Association) format:

"Oxygen: The Life-Giving Element." *Chemistry LibreTexts*. 2019. Web.

# Interactive Activities

Explore, Create, Learn



Interactive activities  
reinforce skills and core  
ideas.

Explore how the elements impact your world with this interactive app provided by and copyrighted to The Open University.



Jumpstart your project or presentation with these interactive activities.



Study smarter with digital flashcards in the classroom, at home, and on the go. For more help, [check out printable study and research sheets](#).



Explore the world at the atomic level with the interactive Element Builder.

# Interactive Activities

The screenshot shows a dark-themed interface for an interactive app. At the top, the title "Elements of the Periodic Table" is displayed. Below it, a paragraph reads: "The elements of the periodic table are everywhere. They make up who we are, and the world around us. Some of them even changed history. Use these apps to find out more about the periodic table and the elements within it." The main content area features five vertical panels, each representing a different interactive activity. The central panel, "ELEMENTS OF THE WORLD", is highlighted with a white border and contains a globe image and the text: "The elements of the periodic table are found all over the world, in different quantities and in different forms. Find out what our world is made up of." Other panels include "PRODUCING THE PERIODIC TABLE", "ELEMENTS THAT CHANGED THE COURSE OF HISTORY", "BODY CHEMISTRY" (with a human silhouette and a bar chart), and "EVERYDAY ELEMENTS" (with a periodic table). Navigation arrows are visible on the left and right sides of the panels. At the bottom, there is a navigation bar with the Open University logo, a "MENU" button, and a set of navigation icons with the text "Try using the cursor keys to navigate".

## Elements of the Periodic Table

The elements of the periodic table are everywhere. They make up who we are, and the world around us. Some of them even changed history. Use these apps to find out more about the periodic table and the elements within it.

**PRODUCING THE PERIODIC TABLE**

Learn about the history of the elements and how the periodic table was born.

**ELEMENTS THAT CHANGED THE COURSE OF HISTORY**

Certain elements have changed people and society in important ways. Use our timeline to see some of the major impacts throughout history.

**ELEMENTS OF THE WORLD**

The elements of the periodic table are found all over the world, in different quantities and in different forms. Find out what our world is made up of.

**BODY CHEMISTRY**

We're all made up of elements. Find out which ones, and what happens when the perfect balance of elements is changed.

**EVERYDAY ELEMENTS**

Everyday elements. Explore the periodic table.

Try using the cursor keys to navigate

The Open University

MENU

The interactive app provided by The Open University allows students to explore how the elements impact their world.

# Interactive Activities



## Create a Podcast!

DOWNLOAD  
BLANK  
CHECKLIST 

### Build Your Checklist: Listen

STEP 1 OF 7

#### Introduction

Podcasting is a popular medium for people on the go. Many people listen to podcasts on their phones or iPods during their commutes to school or work, or while multitasking around the house. What's a podcast? It's an audio or video program that can be downloaded or streamed from the Web, and it can be about any topic. There are podcasts about sports, comedy, politics, celebrities, history, economics, news—you name it, and there's probably a podcast about it!

Podcasts follow different formats. Some are question-and-answer, some follow a narrative and contain many interviews, and some are round-table discussions with a small group of people. In this activity, you'll be preparing to record an audio podcast about the periodic table. For inspiration, check out the Cary Academy's [Periodic Table of Podcasts](#) or the [Chemistry World](#) series of podcasts.

Your Name:



NEXT

### Podcast Checklist:

Students can get a jumpstart on their projects or presentations by using these step-by-step organizations tools.

0% COMPLETE

PRINT CHECKLIST

SAVE AS PDF

EMAIL CHECKLIST

Go to [Activities home](#). (Save your checklist so you don't lose any changes!)

# Interactive Activities

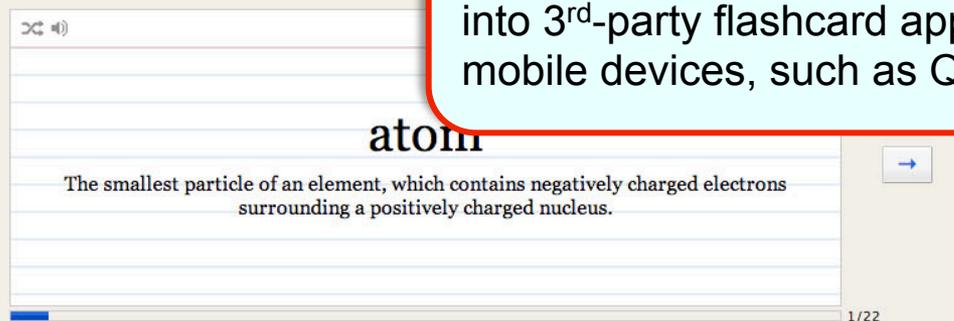
## Flashcards

Study at school, at home, on the go, and with friends by using these [Quizlet](#) flashcards. Use flashcards within your browser on a laptop, PC, or mobile device. Download flashcards with [Quizlet's iOS app](#) or a variety of third-party flashcard apps.

If you have any questions about Quizlet flashcards, [contact us](#).

These downloadable flashcards can be viewed online or imported into 3<sup>rd</sup>-party flashcard apps for mobile devices, such as Quizlet.

### Periodic Table: Key Terms Cards



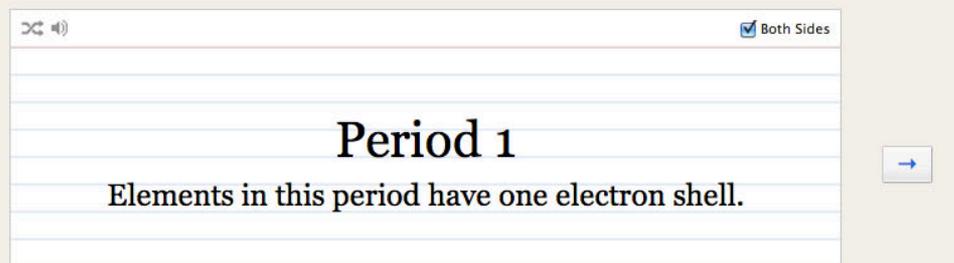
The smallest particle of an element, which contains negatively charged electrons surrounding a positively charged nucleus.

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[Quizlet](#) [View this study set](#)

Choose a Study Mode 

### Periodic Table: Organization Cards



Period 1

Elements in this period have one electron shell.

Both Sides

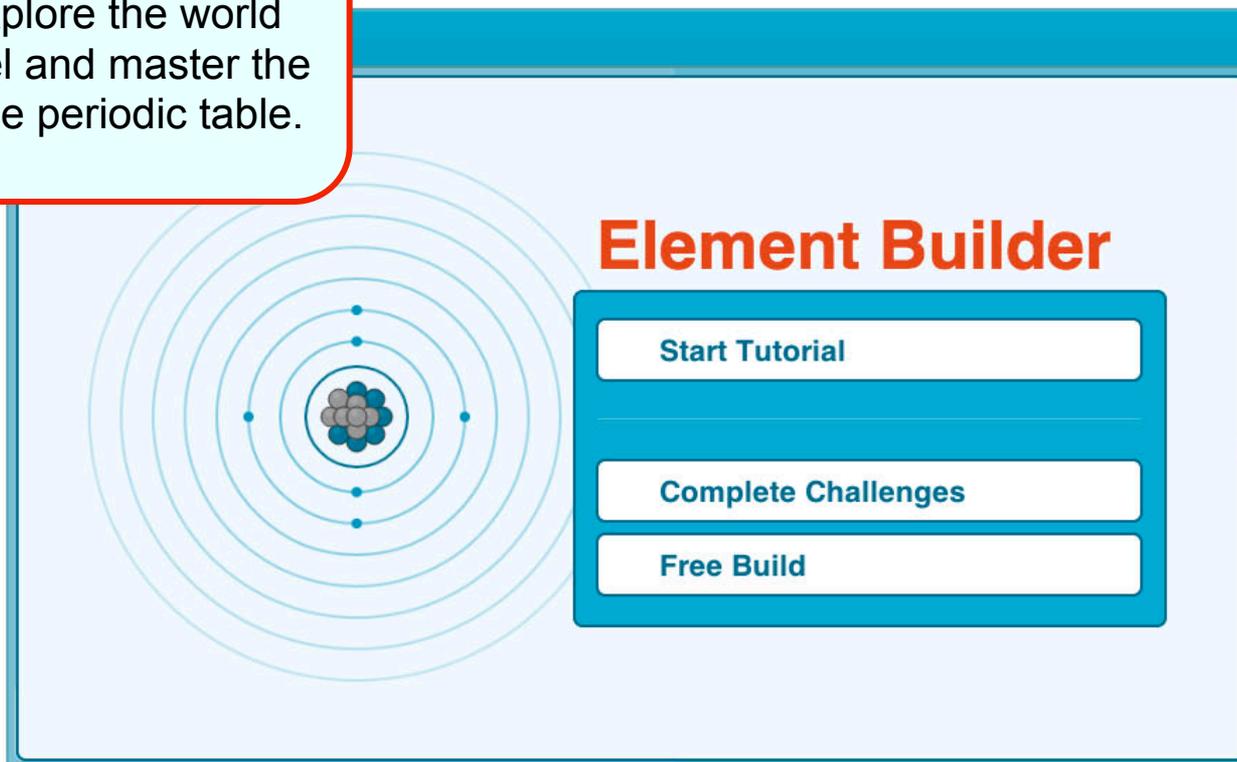
# Interactive Activities

CORE CONCEPTS



Site Help | Logout ROSEN digital >>

The interactive Element Builder helps students explore the world at the atomic level and master the science behind the periodic table.

The Element Builder interface features a central diagram of an atom with a nucleus and concentric electron shells. To the right, the title "Element Builder" is displayed in large orange text. Below the title are three stacked buttons: "Start Tutorial", "Complete Challenges", and "Free Build".

## Element Builder

Start Tutorial

Complete Challenges

Free Build

# Librarian/Educator Resources

CORE CONCEPTS

Site Help | Logout ROSEN digital >>



## Resources for Teachers/Librarians

Curriculum Correlations

Customer Newsletters

Lesson Plans

Online Training

Promotional Materials

Reference Guides

Usage Statistics

User's Guide

Video Archive

Web Buttons



Element Builder



Resources for Teachers and Librarians



Explore, Create, Learn

## Resources for Teachers/Librarians

Core Concepts Periodic Table offers an extensive array of resources to help teachers and librarians most effectively use this online resource. From curriculum correlations and promotional materials to lesson plans and reproducibles, you will find all the tools you need to support your teen users here.

And, to receive the latest on exciting new features of Core Concepts Periodic Table, proven promotional and programming ideas, and advice to best serve your student users, [simply send us your email address](#).

From curriculum correlations and lesson plans, to promotional materials and Web buttons, to online training and usage statistics, you can find all the tools you need.

# About Rosen Publishing

Rosen Publishing is an independent educational publishing house, established in 1950 to serve the needs of students in grades Pre-K to 12th grade with high-interest, curriculum-correlated materials. Rosen publishes more than 750 new print and eBooks each year and has a backlist of more than 7,000 titles.

Rosen Digital launched its inaugural database, the award-winning, critically acclaimed **Teen Health & Wellness: Real Life, Real Answers**, in 2007. The resource has garnered stellar reviews from School Library Journal, Library Journal, Booklist, and American Libraries, and is available in libraries and schools world-wide.

**Core Concepts: Periodic Table** has been created in collaboration with educators across North America by the same extraordinary Rosen team that built Teen Health & Wellness. Maintaining the gold standard set by Rosen Digital's PowerKnowledge Science Suite, CC: Periodic Table supports STEM learning and delivers curriculum-correlated content, promotes digital literacy and 21<sup>st</sup>-century learning skills, and offers research, report, and homework help.

1-877-381-6664

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