



AccessScience User Guide

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About AccessScience

What Is AccessScience?

AccessScience is an authoritative and dynamic online resource that contains incisively written, high-quality educational material covering all major scientific disciplines. An acclaimed gateway to scientific knowledge, AccessScience is continually expanding the ways it can demonstrate and explain core, trustworthy scientific information that inspires and guides users to deeper knowledge.

AccessScience's dedicated editorial team comprises staff editors with subject-matter expertise, in collaboration with thousands of prominent scientists and engineers, including 46 Nobel Prize winners as well as recipients of other major scientific prizes, such as Franklin Institute Awards. With its roots in McGraw-Hill's world-famous scientific publishing program—encompassing the *McGraw-Hill Encyclopedia of Science & Technology* and *McGraw-Hill Yearbook of Science & Technology*—AccessScience draws on and continues a deep tradition of presenting rigorously vetted scientific knowledge and concepts in ways that are both engaging and accessible.

AccessScience offers:

- **THOUSANDS OF ARTICLES** covering all major scientific disciplines, regularly reviewed and updated
- **115,000+ DEFINITIONS** from the McGraw-Hill Dictionary of Scientific and Technical Terms, built into search results
- **HUNDREDS OF BRIEFINGS** on relevant concepts in science and technology—a great starting place for research topic ideas
- **3000+ BIOGRAPHIES** about well-known scientific figures
- **20,000+ IMAGES, VIDEOS, AND ANIMATIONS** illustrating key concepts in engaging and meaningful ways
- **VIDEO BIOGRAPHIES** highlighting the life and work of award-winning scientists
- **20 BOOKS** including nine textbooks and 11 Schaum's Outlines that faculty can use with students in their classes, with more on the way
- **PERSISTENT LINKS TO CITABLE LITERATURE** supporting research assignments through primary sources of information
- **INTERACTIVE CITATION GENERATORS** save time and effort when preparing papers
- **REMOTE ACCESS** allows easy, anytime site access when away from campus

Consulting editors

A board of Consulting Editors, comprising internationally recognized leaders in their respective fields, is committed to choosing the highest quality and most rigorously vetted content for inclusion in AccessScience.

Contributing authors

The thousands of highly distinguished contributors to AccessScience reflect the editorial team's firm belief that readers are best served by solicited expositions of topics written by identified, acknowledged experts in these topics, based on the knowledge of the factual, original literature. The list includes 46 Nobel Prize Laureates and Franklin Award winners.

Homepage

Check Out the New Homepage

- Streamlined top level menu for ease of browsing content
- Rotator display of new and highlighted content
- Persistent site search bar
- Content blocks emphasizing available content types

Access through your institution

AccessScience is available through institutional subscriptions. A message saying “Access via [Your Institution]” will appear in the top right corner of AccessScience if you have been properly authenticated and the site is recognizing your affiliation.

If you are not sure if your institution subscribes, or are not seeing the access message after authenticating, contact Customer Success for assistance.

My Account

Log in to your personal account, create a new account, or see content saved to your account using the “My Account” button in the site header. See the section on [Personal Accounts](#) for more on creating a personal account and available features.

The screenshot displays the AccessScience homepage. At the top left is the Mc Graw Hill logo, and at the top right is the 'Access via Mc Graw Hill' message with a red arrow pointing to it. Below the logos is a dark blue navigation bar with 'Content', 'Topics', 'Information for', and 'About' menus, and a 'My account' button with a user icon and a red arrow pointing to it. The main banner features a space-themed background with the text 'LEARN FROM WORLD LEADERS IN SCIENCE' and 'Award-winning experts contribute to AccessScience', along with a 'Learn more' button. Below the banner is a search bar with the text 'Search AccessScience for...' and a red 'Search' button. The page is divided into three content blocks: 1. 'Nice try, butterfly' with an image of a monarch butterfly and text about insect resistance to toxins. 2. 'Machine learning' with an image of cars on a road and text about machines learning from real-life examples. 3. 'James E. West' with an image of a man and text about his invention of the tiny electret microphone. Each block includes a 'More' link.

Searching

The general search bar is available in the site header from all AccessScience pages and can be used to search across all content on the site. Boolean search techniques, such as 'AND' 'OR' and 'NOT' are supported.

Search Results

Search results pages on AccessScience are organized by relevancy. A dictionary definition for the search term will appear at the top of the results list when available. Definitions are from the latest edition of the *McGraw-Hill Dictionary of Scientific and Technical Terms*.

Each result item will have a content type label, an image, and a brief description. Click on the item to view the full text.

The Save Search button is available at the top of any results page, allowing you to save the search to your personal account. There are also optional search alerts that can be activated to send an email if new items are added that match the search terms. For more on the personal accounts see the [Personal Account](#) section.

The screenshot shows the search results page for 'climate change'. At the top, there is a navigation bar with 'Content', 'Topics', 'Information for', 'About', and 'My account'. Below this is a search bar containing 'climate change' and a 'Search' button. The main heading reads 'Search'.

On the left side, there are two filter panels:

- Content types:** A list of content types with checkboxes and counts. 'All Content' is selected with 711 results. Other options include Articles (455), Biographies (20), Text Biographies (14), Video Biographies (6), Books (0), Book Chapters (24), News (207), Editorial Briefings (83), News Stories (124), and Videos (5).
- Filter results by Topics:** A list of topics with checkboxes and counts. 'All Topics' is selected with 1083 results. Other options include Agriculture, Forestry, & Soils (106), Anthropology & Archeology (16), Astronomy & Space Science (13), Biology (172), Chemistry (24), and Computing & Information Technology (6).

The main content area displays the search results:

- Header:** 'Your search for climate change returned 711 results'. A 'Save search' button is highlighted with a red box.
- Definition:** A red arrow points to the 'Definition' label. The definition for 'climate change' is shown, including its pronunciation and source: 'Any change in global temperatures and precipitation over time due to natural variability or to human activity. Source: McGraw-Hill Dictionary of Scientific and Technical Terms, 6th ed., McGraw-Hill, New York, 2003.'
- Article:** A red arrow points to the 'Article' label. The article is titled 'Global climate change' and includes an image of a factory. The text states: 'Significant and persistent changes in the state of Earth's climate. Earth's past climates, or paleoclimates, have alternated between ice ages and periods warmer than today over relatively long time scales (millions to ten...'
- Video:** A red arrow points to the 'Video' label. The video is titled 'Innovative Ways to Fight Climate Change' and includes an image of a space mirror. The text states: 'This video examines some novel proposals for combating climate change—including space mirrors, seeding the ocean with iron, and feeding cows seaweed. In reality, these ideas may or may not be feasible, but they are ...'
- Editorial Briefing:** An 'Editorial Briefing' label is shown for the item 'Tornado activity and climate change'.

Filtering

From the results page, there are filters available on the left to narrow down results by content type or topic. Use the checkboxes to select or remove filters. The parenthetical number shows how many results from the current results set are tagged to a specific filter.

Content types

<input type="checkbox"/> All Content	322
<input type="checkbox"/> Articles	131
<input type="checkbox"/> Biographies ▼	29
<input type="checkbox"/> Text Biographies	26
<input type="checkbox"/> Video Biographies	3
<input type="checkbox"/> Books	1
<input checked="" type="checkbox"/> Book Chapters	143
<input type="checkbox"/> News ▼	16
<input type="checkbox"/> Editorial Briefings	9
<input type="checkbox"/> News Stories	7
<input type="checkbox"/> Videos	2

Filter results by Topics

<input type="checkbox"/> All Topics	1083
<input type="checkbox"/> Agriculture, Forestry, & Soils >	106
<input type="checkbox"/> Anthropology & Archeology >	16
<input type="checkbox"/> Astronomy & Space Science >	13
<input type="checkbox"/> Biology >	172
<input type="checkbox"/> Chemistry >	24
<input type="checkbox"/> Computing & Information Technology >	6
<input checked="" type="checkbox"/> Earth Science >	333
<input checked="" type="checkbox"/> Ecology & Environmental Science >	203
<input type="checkbox"/> Engineering & Materials >	76
<input type="checkbox"/> Food Science & Technology >	15
<input type="checkbox"/> Forensic Science	2
<input type="checkbox"/> General Science Concepts	1
<input type="checkbox"/> Mathematics >	0
<input type="checkbox"/> Medicine & Health Sciences >	36
<input type="checkbox"/> Paleontology >	57
<input type="checkbox"/> Physics >	22
<input type="checkbox"/> Psychiatry & Psychology >	1
<input type="checkbox"/> Scientific & Engineering Instruments	0

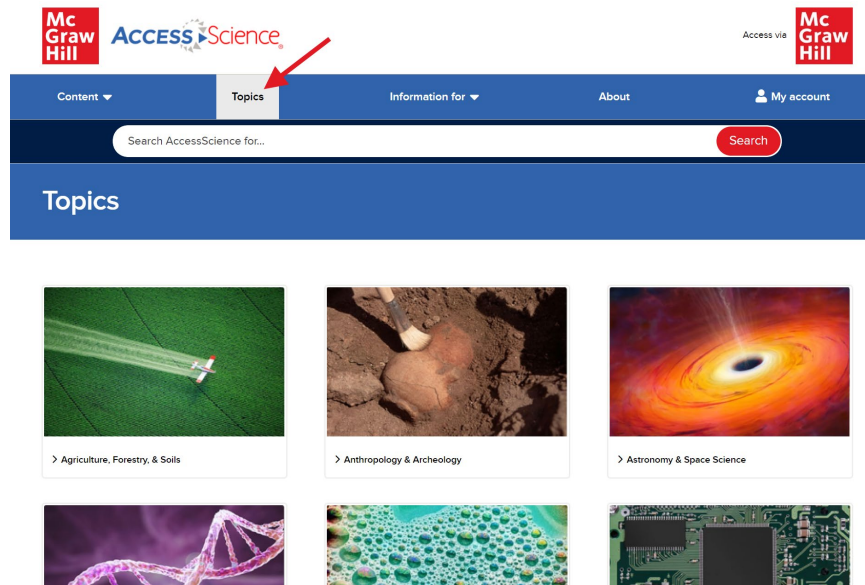
More About Search

The search engine operates by seeking matches with search terms from two distinct types of data pulled from the contents of AccessScience: a layer of semantic metadata associated with each article or other feature, and the exact matches of words or phrases in the text. Semantic matches are those based on the meaning of the search terms and the concepts they describe, allowing the user to find pertinent articles without having to search for all synonyms of a given search term. To supplement these semantic results, the search engine provides all articles and other types of content that contain exact matches to the search terms.

Browsing by Topic or Content Type

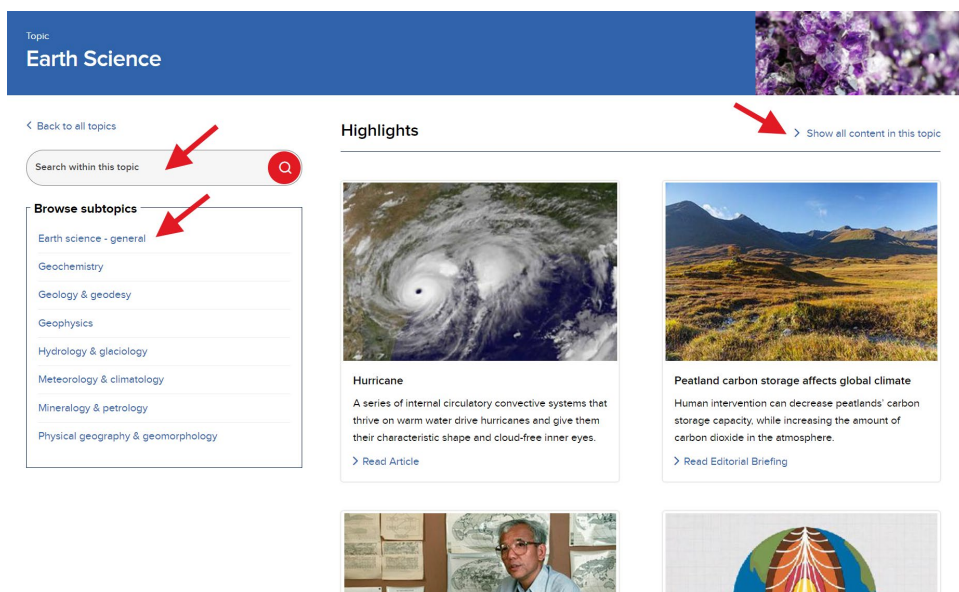
Browse by Topic

To browse by topic, select Topic from the top-level menu. This will show the topic browse page, with 18 major topic areas represented by an engaging image. Click on the image or topic name to view the individual browse page for that topic.



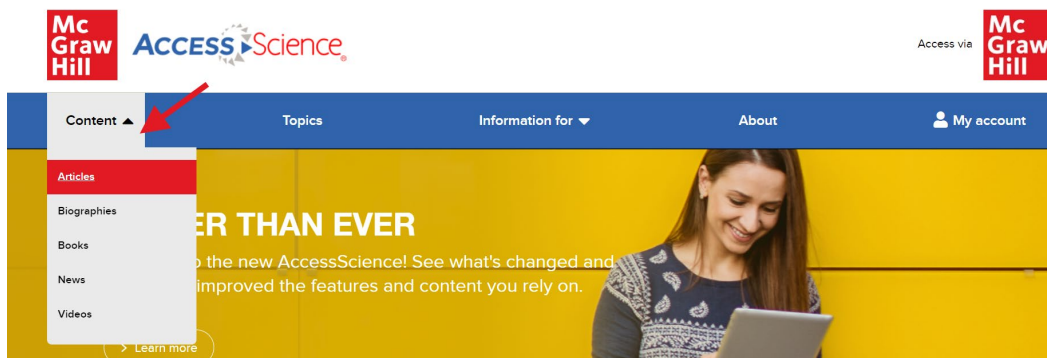
On the individual topic page, highlighted content for that topic will be displayed on the right. Click on the link below an item to open that content item.

To explore a topic further, use the left menu to browse available subtopics, enter search terms to Search within this topic, or select Show all content in this topic. Each of these options will lead to a results page featuring relevant content. See the section on [Searching](#) for more on results pages and filtering.



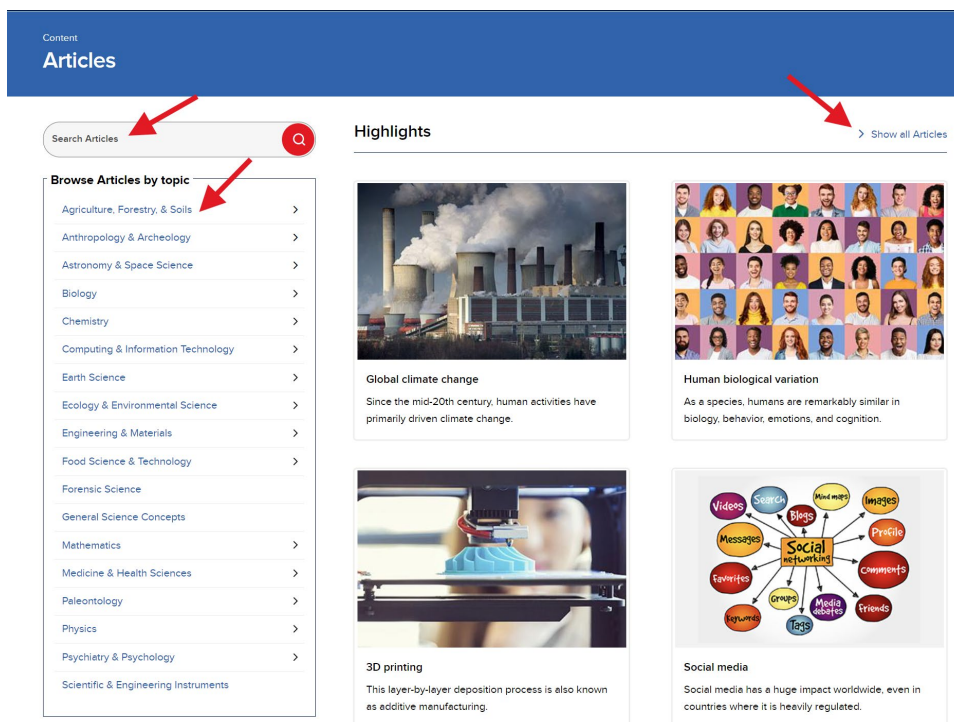
Browse by Content Type

To browse by content type, select Content from the top-level menu and choose from the available content types in the dropdown menu. The next sections of this guide describe the content types in more detail.



Selecting a content type will lead to a browse page for that content, featuring highlighted content items on the right. Click on the link below an item to open that content item.

To explore a content type further, use the left menu to browse available content by topic, enter search terms to Search within this content type, or select Show all. Each of these options will lead to a results page featuring relevant content. See the section on [Searching](#) for more on results pages and filtering.



Content Types

Articles

AccessScience Articles include updated source material from the last edition of the McGraw-Hill Encyclopedia of Science & Technology and previous McGraw-Hill Yearbooks of Science & Technology, including articles exclusive to AccessScience.

Features of articles include:

- Article metadata: expert authors and their affiliations and the date the article was last reviewed.
- Collapsible table of contents and tabs pulling out additional content within articles.
- Figures and graphs with the option to open in a new tab or share a direct link.
- Cross-references to related articles at the end of each paragraph in the article.
- Key Concepts highlighting major points students should be able to identify from the article.
- Self-Test questions to evaluate understanding of the content and encourage critical thinking.
- Related primary literature links to articles from reputable scientific journals to deepen research on a topic.

Article

Photosynthesis

Govindjee | Robert E. Blankenship | Gerald A. Berkowitz | Archie R. Portis, Jr. | R. J. Shopes
 Last reviewed: March 2019
<https://doi.org/10.1036/1097-8542.511700>

Cite | Bookmark | Labels | Annotate | Share

Article | Figures & Tables | Primary Literature | Self Test

Photosynthesis

Key Concepts

- Chlorophyll-containing organisms produce carbohydrates and oxygen.
- Some bacteria conduct anoxygenic photosynthesis and do not produce oxygen.

The synthesis of chemical compounds using light, especially the manufacture of organic compounds (primarily carbohydrates) from carbon dioxide and a hydrogen source (such as water), most often with simultaneous liberation of oxygen, by chlorophyll- or bacteriochlorophyll-containing cells. The term photosynthesis is used almost exclusively to designate one particularly important natural process; the use of light in the manufacture of organic compounds (primarily certain carbohydrates) from inorganic materials by chlorophyll- or bacteriochlorophyll-containing cells (Fig. 1). This process requires a supply of energy in the form of light because its products contain much more chemical energy than its raw materials. This is clearly shown by the liberation of energy in the reverse process, namely the combustion of organic material with oxygen, which takes place during respiration. *See also:* Carbohydrate; Chlorophyll; Energy metabolism; Plant respiration; Respiration

Fig. 1 A simplified diagram of a chloroplast is used to delineate the overall process of photosynthesis. Chloroplasts in the plant cells of leaves absorb light energy and convert it into chemical energy, which is used to synthesize carbohydrates (CH₂O) and liberate oxygen (O₂). (Copyright © McGraw-Hill Education)

Open in new tab
Share

Books

AccessScience Books include select McGraw Hill college-level science books and Schaum's Outlines available in full for students and teachers alike.

Features of books include:

- Collapsible table of contents and tabs pulling out additional content within chapters.
- Previous and next buttons to move through the chapters.
- Focus view to hide everything except the text for ease of reading.

Book

Harper's Illustrated Biochemistry

Victor W. Rodwell | David A. Bender | Kathleen M. Botham | Peter J. Kennelly
P. Anthony Weil

ISBN: 9781259837937 | Copyright © 2018 by McGraw-Hill. All rights reserved.

Cite | Bookmark | Labels | Annotate | Share | Summary PDF

Table of Contents | Description

- A Coauthors
- B Preface
- A SECTION I: Structures & Functions of Proteins & Enzymes
- 1. Biochemistry & Medicine

Related Articles

- Biochemistry
- Chemistry
- Nutrition

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Related News

Book Chapter

2. Vector Analysis

Mahmood Nahvi | Joseph A. Edminister

Schaum's Outline of Electromagnetics

ISBN: 9781260120974 | Copyright © 2019 by McGraw Hill. All rights reserved.

Cite | Bookmark | Labels | Annotate | Share | Summary PDF

Chapter | Videos | Figures | Examples

Hide Table of Contents

- A Preface
- 1. The Subject of Electromagnetics
- 2. Vector Analysis
 - 2.1 Introduction
 - 2.2 Vector Notation

Focus view | < Previous | Next >

2. Vector Analysis

2.1. Introduction

In electromagnetics, vectors are used extensively as the main tool of analysis. They were introduced briefly in Section 1.5, along with some vector operations in the Cartesian coordinate system. This chapter expands the scope of vector algebra to a level needed throughout the rest of the book. It also introduces the cylindrical and spherical coordinate systems, as all three coordinate systems are used in electromagnetics. As the notation

Related Articles

- Quaternions
- Nonrelativistic quantum theory
- Lagrange's equations

Show More

Related News

- New geologic map of Mars
- Asian longhorned tick is an

News

AccessScience News includes Editorial Briefings, topical overviews of newsworthy subjects, designed to engage and inform, and News Stories, timely stories from Science News with links to relevant AccessScience content.

Biographies

AccessScience Biographies include life histories of well-known scientists from the Hutchinson Dictionary of Scientific Biography, plus video biographies of Franklin Institute Award winners

Videos/Animations

AccessScience Videos/Animations include engaging multimedia selections that bring complex concepts to life. Videos all have closed captioning available and some videos can be downloaded for offline use.

Editorial Briefing

Faster-charging batteries for electric vehicles

AccessScience Editors
 Last reviewed: January 2021 <https://doi.org/10.1036/1097-8542.BR0125211>


Cite | Bookmark | Labels | Annotate | Share

Editorial Briefing

Primary Literature

Faster-charging batteries for electric vehicles Focus view

Many new-model electric vehicles (EVs) now have a range of 200 to 300 miles. Consequently, range anxiety—the fear of running out of charge before reaching a charging station—is becoming less problematic. Battery charging times are also decreasing. As of 2020, it takes about eight hours to recharge an EV battery to its full capacity. A number of new and existing battery suppliers are releasing EVs that accept a full charge in 10 to 15 minutes. [See also: Battery](#)



Related Articles


Battery

All About Gluten Focus view

Is gluten good for you, or is gluten bad for you? This video breaks down the chemistry and science behind this controversial food ingredient.

Credit: Reactions/American Chemical Society

Video



[See also: Wheat; Celiac disease; Gastrointestinal tract disorders; Food allergy; Allergy; Food; Yeast; Cereal; Protein; Amino acid; Chemical bond](#)

Related Articles

[Wheat](#)

[Gastrointestinal tract disorders](#)

[Celiac disease](#)

Show More

Related News

[Why people with celiac disease suffer so soon after eating gluten](#)

[Common virus may be celiac disease culprit](#)

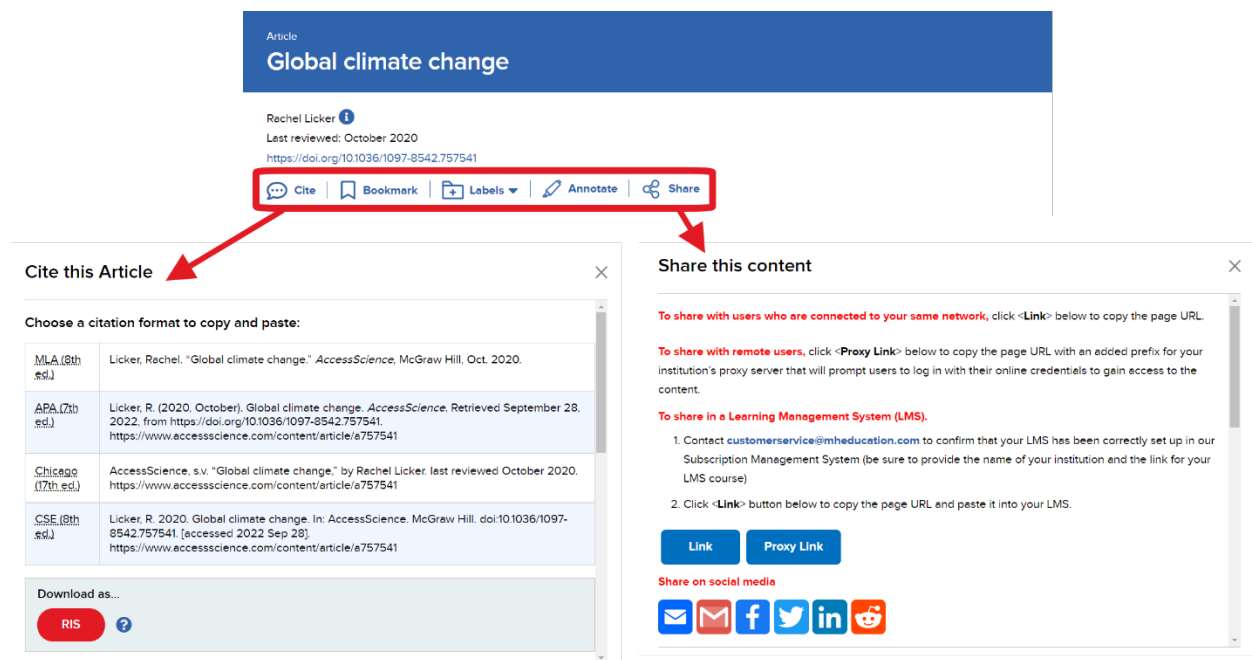
[Kids with food allergies are twice as likely to have autism](#)

Show More

Content Tools

Content tools are available at the top of any content page. Some of the content tools require the creation of a personal account, which is described in the [Personal Account](#) section.

- Cite provides a citation for the content item, available in several styles or for download as an RIS file.
- Bookmark saves the item to your list of bookmarks in your personal account.
- Label saves the item to a folder within your personal account.
- Annotate allows highlighting and commenting using the Hypothesis browser plug. See the next section on [Annotations](#) for more details.
- Share provides a direct link to the content and the option to share that direct link via social media
- Summary PDF downloads a PDF copy of the content item for offline use.



The screenshot shows the article 'Global climate change' by Rachel Licker. A red box highlights the content tools: Cite, Bookmark, Labels, Annotate, and Share. Two pop-up windows are shown below:

Cite this Article

Choose a citation format to copy and paste:

MLA (8th ed.)	Licker, Rachel. "Global climate change." <i>AccessScience</i> , McGraw Hill, Oct. 2020.
APA (7th ed.)	Licker, R. (2020, October). Global climate change. <i>AccessScience</i> . Retrieved September 28, 2022. from https://doi.org/10.1036/1097-8542.757541 .
Chicago (17th ed.)	AccessScience, s.v. "Global climate change," by Rachel Licker; last reviewed October 2020. https://www.accessscience.com/content/article/a757541
CSE (8th ed.)	Licker, R. 2020. Global climate change. In: <i>AccessScience</i> . McGraw Hill. doi:10.1036/1097-8542.757541. [accessed 2022 Sep 28]. https://www.accessscience.com/content/article/a757541

Download as...

RIS

Share this content

To share with users who are connected to your same network, click <Link> below to copy the page URL.

To share with remote users, click <Proxy Link> below to copy the page URL with an added prefix for your institution's proxy server that will prompt users to log in with their online credentials to gain access to the content.

To share in a Learning Management System (LMS).

- Contact customerservice@mheducation.com to confirm that your LMS has been correctly set up in our Subscription Management System (be sure to provide the name of your institution and the link for your LMS course)
- Click <Link> button below to copy the page URL and paste it into your LMS.

Link Proxy Link

Share on social media

Icons for email, mail, Facebook, Twitter, LinkedIn, and YouTube.

Related Content

All content pages also include a related content sidebar on the right. This section highlights additional content that is relevant to the content item currently being viewed. The related content is separated by content type, with each content type box having the option to expand and Show More suggestions.

At the bottom of the related content list is a section for Topics which shows the site topics that are tagged to the content item being viewed. These topics are linked so you can launch a search and see all other content on the site tagged to that specific topic.

Article Figures & Tables Primary Literature Self Test

CRISPR/Cas9 gene editing Focus view

Table of Contents

Key Concepts

- CRISPR/Cas9 gene editing is a technique that allows precise targeting of specific stretches of genetic code and editing of DNA at designated locations.
- CRISPR stands for clustered regularly interspaced short palindromic repeat.
- The cas9 gene encodes a DNA-cutting enzyme, whereas the CRISPR gene encodes many RNA cofactors on the Cas9 enzyme.
- The CRISPR/Cas9 system has been used to engineer the genomes of many different organisms; the system is derived from naturally occurring components of a common prokaryotic immune system.
- The CRISPR/Cas9 system is being developed to correct genetic errors, which could facilitate gene therapies for patients with genetic diseases.

Hide

A genome-engineering technique that allows precise targeting of specific stretches of genetic code and editing of DNA at designated locations. The CRISPR/Cas9 system has been used as a general tool to engineer the genomes of many different organisms; the system is derived from naturally occurring components of a common prokaryotic immune system. Clustered regularly interspaced short palindromic repeats (CRISPRs) and cas9 are genes found in Bacteria and Archaea, and they mediate immunity in these species (Fig. 1). The cas9 gene

Related Articles

- Nobel Prizes for 2020
- Restriction enzyme
- Genetically modified organism (GMO)

Show More

Related News

- Expanded range for CRISPR gene editing
- Gene-editing tool CRISPR wins the chemistry Nobel

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Related Book Chapters

- Toxic Responses of the Immune System
- The Flow of Genetic Information

Show More

Topics

- Biomedical engineering & therapy
- Biology
- Genetics

Annotations

For annotating content on AccessScience, we've teamed up with [Hypothesis](#), an open-source annotation tool that can be used across any digital resource. Create a free Hypothesis account to save and access annotations in AccessScience and across any other websites you use.

To annotate in AccessScience:

- Click the Annotate button from any content page to open the Hypothesis toolbar.
- Choose a group to share annotations with or save to your personal account.
- Select text quickly highlight or add an annotation.
- Categorize your annotations with tags, edit or delete your annotations, or reply to annotations.

McGraw Hill Search AccessScience for...

Curtis D. Klaassen | John B. Watkins, III

Casarett & Doull's Essentials of Toxicology

ISBN: 9781260452297 | Copyright © 2022 by McGraw Hill. All rights reserved.

Cite Bookmark Labels **Annotate** Share

Chapter Figures Tables

Focus view

3. Mechanisms of Toxicity

Annotations 1 Page Notes

ASWeinheimer 18 hrs ago

(1) delivery of the toxicant to its target; (2) interactions between the toxicant and its target or the microenvironment; (3) progression to cellular dysfunction; and (4) inappropriate repair or adaptation

Four-step process of toxicity, which step has the most effect on the subsequent cell damage?

Less

Annotations toolbar: Edit, Delete, Reply, Share

To manage annotations in your Hypothesis account:

- Click on your account to see all your annotations across different resources or groups.
- View annotation content and link to visit in context.
- Display current group members or invite new members with the shareable link.
- Get additional help on using Hypothesis from their FAQs and tutorials.

Personal Account

AccessScience has several features which are available only after signing up for a free personal account. Personal accounts are an optional feature and are not required to view or use any of the content on the site. Personal accounts do not replace authentication via your institution; you must first be logged in through your institution to use AccessScience.

To register for a free personal account:

- Click on My Account in the top menu to open the Manage Access window, where you will see your subscribing organization information.
- Select log in via email/username.
- Register for an account by entering the required information.
- You can reset your password if needed using the “Forgot password?” link on the login screen.

The screenshot shows the AccessScience website interface. At the top, the McGraw Hill logo and 'ACCESS Science' are on the left, and 'Access via McGraw Hill' is on the right. A blue navigation bar contains 'Content', 'Topics', 'Information for', 'About', and 'My account' (highlighted with a red box). Below the navigation bar is a banner with the text 'LEARN FROM WORLD LEADERS IN SCIENCE'. Below the banner are two screenshots of the user interface:

Manage Access via SAMS Sigma

Manage Access

You already have full content access to AccessScience through your institution. Some site functionality such as bookmarking and alerts require a personal account in addition to content access. To Sign In or Register for a personal account, select Log in via email/username.

You are logged in as...

McGraw Hill (organization)
via IP address

Log in via email/username (highlighted with a red box)

Log in via a library card

Redeem a voucher

Log in via your institution

[Return to the website](#)

Manage Access via SAMS Sigma

Log in via email/username

[Back](#)

Email or username

Email or username

Password

Password

[Forgot password?](#) (indicated by a red arrow)

Log in [Register](#) (indicated by a red arrow)

[Return to the website](#)

Personal Account features include:

- Add bookmarks or labels to content to organize and easily retrieve content.
- Save searches and set up email alerts for new content that matches your search terms.
- Select your interests to receive updates when new content is added in those areas.

Support

The Information For option from the top-level menu provides additional resources for Educators and Librarians.

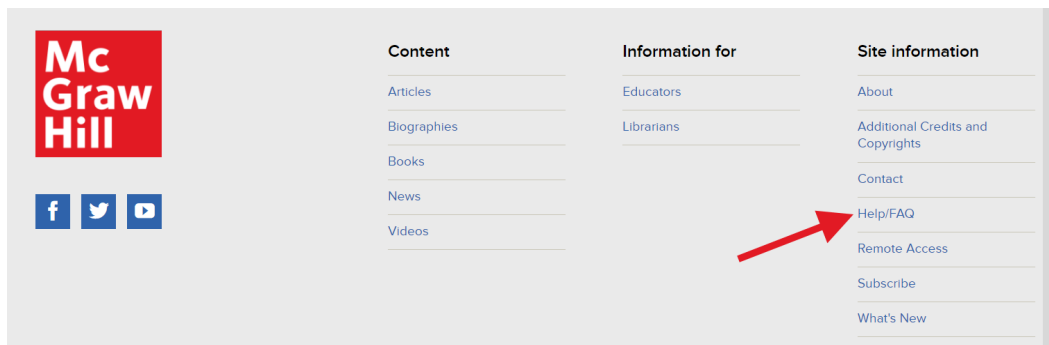
The Educators page includes:

- Link to a document containing answers to the Self-Test article questions
- Guide to using AccessScience in distance learning
- Recordings of author-led topical webinars

The Librarians page includes:

- Information on setting up Proxy Server access
- Instructions for accessing the SAMS Sigma admin portal for usage statistics and account information
- MARC records
- Site accessibility information
- Promotional materials
- User guides and video tutorials
- Information on upcoming trainings and recordings of previous training sessions and topical webinars

There is also a Help/FAQ page linked in the site footer which contains additional information on using the site and common issues.



Contact Us

For further questions and help, please email **Customer Success** at **McGraw Hill** at customersuccess@mheducation.com.