



The authoritative online STEM education resource

Platform User Guide



Table of Contents

[Homepage](#)

[Search & Browse](#)

[Articles](#)

[Briefings](#)

[News](#)

[Biographies, Media & Projects](#)

[Curriculum Maps](#)

[Personal Account](#)

[Administration](#)

[Mobile Access](#)

Homepage

The screenshot shows the AccessScience homepage with the following elements and callouts:

- Callout 1:** Points to the search bar labeled "Search AccessScience".
- Callout 2:** Points to the "Browse articles by subject" link in the left sidebar.
- Callout 3:** Points to the "Editors' Picks" section, which features articles like "Hydrogen-powered marine vessels" and "Geotechnical engineering".
- Callout 4:** Points to the "Browse by content type" link in the top navigation bar.
- Callout 5:** Points to the "Your Personal Account" link in the left sidebar.

The homepage includes a top navigation bar with links for Home, Articles, Briefings, News, Biographies, Media, Projects, For Faculty, and For Admins. It also features a search bar, a subject-based article browser, and sections for Editors' Picks and Popular This Week.

The AccessScience homepage highlights the breadth and variety of content available on the site. The main content of the site is composed of articles originating from the McGraw-Hill Encyclopedia of Science and Engineering. These in-depth and expert-written articles cover everything from astronomy to zoology.

As shown in the image above, the homepage allows users to:

1. Start a search by entering terms into the general search bar or use the advanced search feature for more options.
2. Select a subject from the list to browse available articles.
3. View articles that are trending this week, or select an editor's pick to view content that is new or newsworthy.
4. Browse through additional content types including briefings, biographies, media, and projects.
5. Create a personal account to unlock additional functionality such as saving resources or getting new content alerts.

Search & Browse

Explore content on AccessScience using the search bar to enter terms, or browse through lists of content by topic. The typeahead feature suggests content relevant to your search terms as you type.

From the search results:

1. See a definition of your search term
2. Apply filters to refine your results by content type or topic
3. Quickly identify the content types of displayed results
4. Save this search to your personal account
5. Save specific results to your personal account

To browse for content:

6. From any of the content tabs, select “by Topic” to browse that content
7. Select a topic to browse from the dropdown menu
8. Select a subtopic from the menu on the left
9. View available articles for the selected subtopic

AccessScience > Articles

Search Results

2 Filter options

4 Save to personal account

1 Search term definition

3 Content type labels

5 Save specific resources

Refine this search

Content Type

- ☒ All Content (33)
- ☐ Image (15)
- ☐ Article (7)
- ☐ News (5)
- ☐ Video / Animation (3)
- ☐ Briefing (2)
- ☐ Biography (1)

Topic

- ☒ All Topics (33)
- ☐ Biology & Biomedicine (27)
- ☐ Health Sciences (11)
- ☐ Zoology (3)
- ☐ Science Theory & Philosophy (2)
- ☐ Agriculture, Forestry & Soils (1)
- ☐ Botany (1)
- ☐ Paleontology (1)

CRISPR 33 results

Definition

CRISPR/Cas9 gene editing

A genome-engineering technique that allows precise targeting of specific stretches of genetic code and editing of DNA at designated locations.

Source: AccessScience, McGraw-Hill Education, 2019

Briefing

Expanded range for CRISPR gene editing

Published in 2018

CRISPR/Cas9 gene editing is a modern technique that targets specific stretches of genetic code and allows editing of deoxyribonucleic acid (DNA) at designated locations. It has been at the forefront of genetic research, providing scientists...

Article

CRISPR/Cas9 gene editing

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...

Video / Animation

The Legal Battle over CRISPR

U.S. PATENT AND TRADEMARK OFFICE

ALEXANDRIA, VA

CRISPR/Cas9 is making gene-editing cheaper and easier than ever before, but its developers have been embroiled in a fierce dispute over who holds the patents to CRISPR technology. In early 2017, Ryan Cross went to the U.S....

AccessScience > Articles > Health Sciences > Infectious diseases and epidemiology

Articles

6 Browse by topic

7 Select topic from dropdown

8 List of subtopics

9 List of available articles

Articles A-Z Articles by Topic

Topic: **Health Sciences**

Select Topic

Subtopic: **Infectious diseases and epidemiology**

Subtopics:

- Acquired immune deficiency syndrome (AIDS)
- Alzheimer's disease
- Ames disease
- Amoebic encephalitis
- Avian influenza (bird flu)
- Bacillary dysentery
- Baylisascariasis
- Biological basis of natural resistance to HIV
- Botulism
- Broadly neutralizing antibodies
- Bronchiolitis obliterans organizing pneumonia (BOOP)
- Brucellosis
- Canine influenza
- Cat scratch disease
- Chickenpox and shingles
- Chikungunya virus disease
- Cholera
- Cholera in Haiti
- Clinical pathology
- Clostridium difficile outbreaks
- Common cold
- Contagious cancers
- Cytomegalovirus infection
- Dengue fever
- Diarrhea
- Diphtheria
- Disease ecology
- Ebola virus
- Ebola virus outbreak in 2014–2015
- Ehrlichiosis
- Emerging diseases in marine mammals
- Encephalitis (arboviral)
- Enterovirus

Articles

AccessScience | Articles

Article

Astronomy & Space Science • Astronomy - general • Black hole
Astronomy & Space Science • Astrophysics • Black hole
Physics • Relativity • Black hole

Black hole

Article by:
Pasachoff, Jay M. Hopkins Observatory, Williams College, Williamstown, Massachusetts.
Last retrieved: March 2019
DOI: <https://doi.org/10.1036/1097-8542.085900>
[Show previous versions](#)

Content Hide ▲

| | | |
|----------------------------|---------------------------------------|-------------------------------|
| • Black hole classes | • Observation | • Links to Primary Literature |
| • Stellar black holes | • Black holes and gravitational waves | • Additional Readings |
| • Supermassive black holes | • Fate of black holes | |

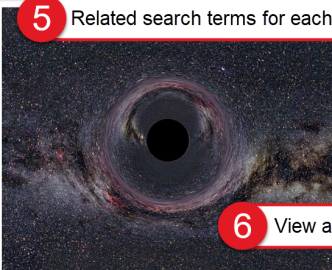
Key Concepts Hide ▲

- A black hole is a region of spacetime exerting a gravitational field so strong that neither matter nor radiation can escape.
- Within a boundary known as the event horizon, the escape velocity needed to overcome the gravitational attraction of a black hole would exceed the speed of light, meaning that nothing that crosses over the event horizon can ever leave.
- At the center of a black hole, a finite mass collapsed to an infinitely small volume, creating an infinitely dense state of matter.

Most salient points of article

A region of spacetime exerting a gravitational field so strong that neither matter nor radiation can escape. Black holes are extreme cosmic objects predicted by German-born U.S. physicist Albert Einstein's theory of general relativity. Within a boundary known as the event horizon, the escape velocity needed to overcome the gravitational attraction of the black hole would exceed the speed of light, meaning that nothing that crosses over the event horizon can ever leave. Black holes are therefore by definition invisible, but because of their powerful gravitational fields, they can be indirectly observed through the highly conspicuous effects they have on their cosmic environment. These effects include the gravitational intake of matter through accretion disks, a process which generates tremendous heat and light and is well-observed at scales from binary star systems to the cores of galaxies. In the absence of ongoing accretion, black holes should also theoretically cause severe localized warping of spacetime, gravitationally lensing light from luminous sources and distorting their appearance (**Fig. 1**). The merging of two black holes each of about 30 times the Sun's mass, detected in 2015 with the Laser Interferometer Gravitational-wave Detector (LIGO), opened a new and fruitful way of studying black holes, and revealed a mass range of stellar black holes greater than had been thought to be possible. See also [Astronomy; Escape velocity; Gravitation; Gravitational lens; Gravitational radiation; LIGO \(Laser Interferometer Gravitational-wave Observatory\); Relativity](#)

Related search terms for each paragraph



View and download images

Fig. 1 An artist's impression of the gravitational lensing caused by a black hole's warping of localized spacetime. (Credit: Ute Kraus, Physics education group Kraus, Universität Hildesheim)

[Full-size image ►](#)

my ACCESS³ Science

Save articles and searches. Get new content alerts.

My Account Sign Out

User Name


Access via Your Institution

Saved items 3
Saved searches 2

Related Articles

In a first, scientists took the temperature of a sonic black hole
LIGO snags another set of gravitational waves
The first picture of a black hole opens a new era of astrophysics
Neutron star collision detected through gravitational waves and light
On October 16, 2017, researchers announced for...
[More...](#)

Related Media



[Why We Are Made of "Star Stuff"](#)
[More...](#)

Related Biographies

Sunyaev, Rashid
Rees, Martin John (1942–)
Hawking, Stephen William (1942–2018)
Einstein, Albert (1879–1955)

Test Your Understanding

- How does the horizon of a black hole act as a one-way membrane?
- How were black holes first detected?
- Critical Thinking: Why might Hawking radiation never be detectable?

Links to Primary Literature

B. P. Abbott et al., Observation of gravitational waves from a binary black hole merger, *Phys. Rev. Lett.*, 116(6):061102, 2016 DOI: <https://doi.org/10.1103/PhysRevLett.116.061102>

E. Kara et al., The corona contracts in a black-hole transient, *Nature*, 565(7738):198, 2019 DOI: <https://doi.org/10.1038/s41586-018-0803-x>

F. Pacucci et al., Conditions for optimal growth of black hole seeds, *Astrophys. J.*, 850(2):L42, 2017 DOI: <https://doi.org/10.3847/2041-8213/aa9aea>

K. Parfrey, A. Philippov, and B. Cerutti, First-principles plasma simulations of black-hole jet launching, *Phys. Rev. Lett.*, 122(3):035101, 2019 DOI: <https://doi.org/10.1103/PhysRevLett.122.035101>

Additional Readings

C. Bambi (ed.), *Astrophysics of Black Holes: From Fundamental Aspects to Latest Developments*, Springer, 2016

M. Bartusiak, *Einstein's Unfinished Symphony: The Story of a Gamble, Two Black Holes, and a New Age of Astronomy*, Yale University Press, 2017

J. M. Pasachoff and A. Filippenko, *The Cosmos: Astronomy in the New Millennium*, 5th ed. Cambridge University Press, 2019

ACCESS³ Science

Save articles and searches. Get new content alerts.

My Account Sign Out

User Name


Access via Your Institution

Saved items 3
Saved searches 2

Related Articles

In a first, scientists took the temperature of a sonic black hole
LIGO snags another set of gravitational waves
The first picture of a black hole opens a new era of astrophysics
Neutron star collision detected through gravitational waves and light
On October 16, 2017, researchers announced for...
[More...](#)

Related Media



[Why We Are Made of "Star Stuff"](#)
[More...](#)

Related Biographies

Sunyaev, Rashid
Rees, Martin John (1942–)
Hawking, Stephen William (1942–2018)
Einstein, Albert (1879–1955)

1 Article metadata

2 Save, cite and share

3 Most salient points of article

4 Explore related content

5 Related search terms for each paragraph

6 View and download images

7 Self-assessment of learning

8 Access to primary literature and further reading

AccessScience articles are written by world-renowned scientists and experts in their field. Thousands of expert scientists and engineers have contributed, including over 40 Nobel Prize Laureates. Articles are skillfully edited to be engaging and informative and contain pedagogical features to increase student understanding.

Features of most articles include:

1. Article metadata, including authors and their affiliations and the date the article was last reviewed, and previous versions
2. Tools to save the article to your personal account, generate a citation, or share via email, link, or social media
3. Key Concepts highlighting major points students should be able to identify from the article
4. Internal links to related content such as articles, media, and biographies to explore a topic further
5. Cross-references to related articles also appear at the end of each paragraph in the article
6. Images and figures appear throughout the articles and can be downloaded individually or for the whole article
7. Self-assessment questions test student understanding and encourage higher-level critical thinking
8. External links to related primary literature and references to additional readings and websites direct students to deeper research

Briefings

AccessScience briefings are shorter, topical articles written by AccessScience editors on the latest discoveries, phenomena, and scientific breakthroughs.

A new briefing is always featured on the homepage under Editor's Picks, or users can browse through all briefings by topic. With their engaging content and highly relevant topics, briefings are a great tool for helping students pick a topic for a research assignment.

Briefings contain many of the same features as articles, such as:

1. Date the briefing was published on AccessScience
2. Content tools to save the briefing to your personal account, generate a citation, or share via email, link, or social media
3. Links to related articles, media, and biographies to explore a topic further
4. Links to related articles to dive deeper and learn more about the concepts and topics discussed in the briefing
5. Links to additional external sources, including the original paper or report where this discovery was published, as well as additional resources to give more background on the underlying concepts

The screenshot shows the AccessScience interface for a briefing titled "Possible new species of killer whale". The page is structured with a main content area and a right-hand sidebar. Numbered callouts highlight specific features:

- 1 Date of briefing:** Points to the "Last reviewed: April 2019" text.
- 2 Content tools:** Points to the "Content tools" button in the top right corner.
- 3 Related articles and media:** Points to the "Related Articles" and "Related Media" sections on the right sidebar.
- 4 Links to articles related to each paragraph:** Points to the "Antarctic Ocean, Antarctica; Deoxyribonucleic acid (DNA); Genetics" link at the end of a paragraph.
- 5 Links to additional sources:** Points to the "Additional Readings" section at the bottom of the page.

The main content area includes the title "Possible new species of killer whale", the author "Biology & Biomedicine", the date "Last reviewed: April 2019", and a DOI link. The text describes the killer whale (orca) as a predatory cetacean and discusses the discovery of a new species, Type D orca, in the Antarctic region. It mentions that Type D orcas are distinct from other orcas and are found in the subantarctic region. The text also discusses the genetic analysis of Type D orcas and the potential for a new species.

The right sidebar contains sections for "Related Articles", "Related Media", and "Related Biographies". The "Related Articles" section lists articles such as "Killer whale A predatory, cosmopolitan cetacean mammal...", "De-extinction The science of restoring an extinct animal or...", "DNA microarray An ordered array of DNA probes providing a...", and "Neanderthal DNA The deoxyribonucleic acid of Homo...". The "Related Media" section shows a video titled "Why Don't Antarctic Fish Freeze to Death?". The "Related Biographies" section lists biographies for Seaman, Nadrian C., Wallace, Douglas C., Horvath, Philippe, and Lorus, Claude.

The bottom of the page features a "Cite this" button, a "Save to My AccessScience" button, and a "Download All Images Image Policy" button.

News

AccessScience includes curated content from *Science News* magazine, an independent source of accurate information on the latest news in science, medicine, and technology.

See a featured news story under Editor's Picks, or use the News content tab to browse news stories by year or by topic. News also appears as a content filter in search results.

All News stories include a byline and the date the story was published, as well as a link to the original research referenced in the story. A link to more information on *Science News* can be found at the bottom of every news story.

AccessScience > News

News

Agriculture, Forestry & Soils > Forestry > Fingerprints of climate change are increasingly appearing in extreme weather
 Earth Science > Meteorology and climatology > Fingerprints of climate change are increasingly appearing in extreme weather
 Earth Science > Oceanography > Fingerprints of climate change are increasingly appearing in extreme weather

Fingerprints of climate change are increasingly appearing in extreme weather

by Carolyn Gramling December 10, 2019

1 Byline and date of story

Fires, floods and vanishing sea ice are among the 2018 disasters attributed to human activity

SAN FRANCISCO — Extremely low sea ice in the Bering Sea. Heavy rainfall in the mid-Atlantic United States. Wildfires in northeast Australia.

GOING LOW Bering Sea ice extent on April 1, 2013, (left) is in line with the average extent of the region's sea ice over the last five decades. But on April 1, 2018, (middle) the Bering Sea was nearly ice-free. Such a low sea ice extent would have been nearly impossible without human-caused climate change, scientists say. Similarly, sea ice extent on April 1, 2019, (right) was among the lowest in the satellite record. (Credit: National Snow and Ice Data Center)

Full-size image

Examinations of these and 16 other extreme weather events that occurred in 2018 found that all but one were made more likely due to human-caused climate change, scientists reported December 9 at a news conference at the American Geophysical Union's annual meeting. Insufficient observational data made it impossible to assess the influence of climate change on the one event, heavy rains in Tasmania.

See also: Air pressure; Atmospheric general circulation; Australia; Bering Sea; Extreme weather events; Forest fire; Global climate change; Massive seabird die-off attributed to ocean warming; Precipitation (meteorology); Sea ice

Reference:
 Explaining extreme events from a climate perspective. *Bulletin of the American Meteorological Society*. Published online December 9, 2019.

From Science News Web edition. © Society for Science & the Public 2015–2019. All rights reserved. www.sciencenews.org

2 Story reference and info on Science News

3 News content tab

Mc
Graw
Hill

ACCESS Science®
 The Science Authority

Home Articles Briefings **News** Biographies Media P

Search Site Content

Search AccessScience for... Advanced Search Search

3 News content tab

AccessScience > News > By Year

News

Timely reports on scientific developments

News by Year News by Topic

4 Browse by Year or by Topic

2019 2018 2017 2016

Ocean acidification could degrade sharks' tough skin (Dec 2019)
 Why some whales are giants and others are just big (Dec 2019)
 Flooding Earth's atmosphere with oxygen may not have needed a triggering event (Dec 2019)
 Licelike insects munched on dinosaur feathers around 100 million years ago (Dec 2019)
 Fingerprints of climate change are increasingly appearing in extreme weather (Dec 2019)
 Electric charges on dust grains may help explain how planets are born (Dec 2019)
 Scientists' brains shrank a bit after an extended stay in Antarctica (Dec 2019)
 Climate-warming CO2 emissions will hit a record high in 2019 (Dec 2019)
 An ancient outbreak of bubonic plague may have been exaggerated (Dec 2019)
 A new, theoretical type of time crystal could run without outside help (Nov 2019)

Biographies, Media & Projects

AccessScience contains additional multimedia content including biographies, animations, videos, and projects to bring STEM learning to life. All content types have tools to save, cite, and share direct links to these resources, and all videos include closed-captioning.

1. View our collection of text and video biographies of prominent scientists. Video biographies are all under six minutes and describe the featured scientist's background and developing interest in science as well as their significant contributions.
2. Choose from over 300 videos and animations to illustrate and explain various scientific concepts. Videos include a curated collection from the American Chemical Society on the chemistry of everyday life.
3. Browse available projects to find step-by-step illustrated guides to hands-on maker activities. Supply lists and introductory background details are available for each project.

Video Biography

Chemistry > Dresselhaus, Mildred S.
Engineering & Materials > Dresselhaus, Mildred S.
Physics > Dresselhaus, Mildred S.

Dresselhaus, Mildred S.

Benjamin Franklin Medal in Materials Science and Engineering



0:00 / 4:22

Massachusetts Institute of Technology
Cambridge, Massachusetts
Year: 2017
Award: Benjamin Franklin Medal in Materials Science and Engineering

Citation: The 2017 Benjamin Franklin Medal in Materials Science and Engineering was presented to Mildred S. Dresselhaus for her fundamental contributions to nanomaterials, such as the spheres known as buckyballs and the single-atom-thick sheets of carbon known as graphene, and for her work on the direct conversion of light to electricity.

Biographical Information

Widely known as the "Queen of Carbon," Mildred S. Dresselhaus made crucial advances in the understanding of the properties of carbon during her nearly 60 years at the Massachusetts Institute of Technology. In February 20, 2017, at age 86, her life remains a testament to the power of science despite any obstacle.

1 Biographies

my ACCESS Science

Your personal account

Related Articles

Carbon A chemical element, C, with an atomic number of 6.
Carbon nanotubes Molecular-scale tubes of graphitic carbon with a diameter of a few nanometers.
Fullerene A hollow, pure carbon molecule in which the atoms are arranged in a spherical or tubular structure.
Graphene The basic building block of graphite, a single layer of carbon atoms.

Related Media

How to Make Electronic Skin with Stanford University's Zhenan Bao

2 Videos

my ACCESS Science

Your personal account

Are We Running Out of Helium?

Chemistry > Inorganic chemistry > Are We Running Out of Helium?
Physics > Low temperature physics > Are We Running Out of Helium?

Helium has helped create revolutionary scientific innovations, and has industrial uses that simply cannot be replicated. Yet helium—a gas that defies gravity—is constantly being lost as it escapes Earth's atmosphere into space. This video explores innovations of the industrial era of helium, how much helium remains, and whether or not this element will go extinct.

Credit: Reactions/American Chemical Society



0:00 / 4:34

See also: Absolute zero; Arc welding; Atmosphere; Diving; Helium; Liquid helium; Magnetic resonance; Natural gas; Noble gases; Nuclear magnetic resonance (NMR); Periodic table; Superconductivity

3 Projects

my ACCESS Science

Your personal account

Light and Temperature Logger

Engineering & Materials > Light and Temperature Logger

Skill level: ★★★

By: Simon Monk, electronics hobbyist and author
Publication year: 2016
DOI: <https://doi.org/10.1039/1087-8542.PR000015>
Adapted from S. Monk, *The TAB Book of Arduino Projects: 36 Things to Make with Shields and Proto Shields*, McGraw-Hill Education, 2014

Environmental research often involves the use of data loggers to record data at regular intervals over a period of time. Most data loggers are based on digital processors, and can be fairly expensive, but you can build your own. This project uses a microcontroller board (an Arduino Uno) and some extra components soldered onto a prototyping shield (protoshield) to allow you to log temperature and light readings for environmental monitoring purposes, and send them to your computer. When you have finished logging, you can import the data into a spreadsheet to display or analyze them.



The completed data logger. [Full-size image](#)

Things You Will Need

| Part | Description | Source |
|--|--|----------------------|
| Arduino | Arduino Uno R3 | Arduino online store |
| Protoshield R3 (A000077) PCB and header pins | Newark 78T1602 or Digikey 1050-1035-ND | |
| 1 kΩ photoresistor ¹ | Adafruit 161 or Sparkfun SEN-00888 | |
| TMP36 temperature sensor | Adafruit 165 or Sparkfun SEN-10988 | |
| 1 kΩ resistor | Mouser 293-1K-RC | |
| 270 Ω resistor | Mouser 273-270-RC | |
| Red LED ¹ | Adafruit 845 or Sparkfun COM-10632 | |
| Tactile push switch | Adafruit 367 or Sparkfun COM-09190 | |
| USB battery backup pack ² | Computer or electronics store | |
| Table-tennis ball (optional) ³ | Sporting goods store | |
| Waterproof food container | Home goods store | |

considerably in resistance range. The one used in this project has a "light" resistance of 1 kΩ. If you of higher resistance, then select a resistor of the same value for R1.
of the LED is your choice. It does not have to be red.
ack is of the sort used to provide backup power to a cell phone. The idea is that you connect the SB socket of your computer or to a USB charger, it charges its own internal battery, and you can then to it and charge or run your phone (or an Arduino). Be warned, though, that some of these devices will power consumption of the Arduino, and may turn themselves off after a while.
You can add half a table-tennis ball or some other hemispherical, translucent diffuser over the top of the by no means essential, and you can just place the whole unit in a translucent plastic food-storage have the added advantage of protecting the unit against the elements.

Related Articles

Helium A gaseous chemical element, He, atomic number 2.
Noble gases The group 18 elements of the periodic table.
Periodic table A list of chemical elements arranged along.
Atmosphere A gaseous layer that envelops the Earth and most.

Related Media

The Periodic Table

Related Biographies

Lorius, Claude
Simon, Franz Eugen (1893–1966)
Ramsay, William (1852–1919)
Dewar, James (1842–1923)

Curriculum Maps

The For Faculty section of AccessScience provides additional resources specifically for faculty using AccessScience in their courses. One of these resources are our curriculum maps, which make it easy to incorporate engaging content into lessons. These maps were designed by leading science and engineering faculty and highlight content relevant to common course topics for all of the subject areas covered in AccessScience.

AccessScience > For Faculty

For Faculty 1 List of maps by subject

AccessScience Curriculum Maps

These Curriculum Maps guide you to highly relevant and engaging content from throughout AccessScience for use in your teaching. These maps have been designed by leading science and engineering faculty, who have carefully selected useful content, such as tables, graphs, diagrams, photos, animations, and videos, and then mapped that content to standard topics taught within each course. You can easily incorporate this content into your curriculum by using the "Copy Link" functionality to paste a direct link into your school's learning management system.

AccessScience > For Faculty > Curriculum Maps

Curriculum Map

Astronomy

Author:
Martin Hackworth, Senior Lecturer, Idaho State University, Pocatello, Idaho

This Curriculum Map provides a list of highly relevant and engaging content from throughout AccessScience for use in enriching your teaching. Site assets such as tables, graphs, diagrams, photos, and animations have been mapped to standard topics taught in an introductory Astronomy course. Use the "Copy Link" functionality to paste a direct link from each asset into your school's learning management system for easy incorporation into your curriculum.

Course Topics

- Historical Astronomy
- Celestial Mechanics
- The Night Sky
- The Earth-Moon System
- The Solar System
- The Sun
- Stars
- Galaxies
- Cosmology

2 Outline of course topics

3 Content type, description, and suggested use

| Asset | Description |
|---------------------|--|
| Diagram | This diagram, from the article <i>Archaeoastronomy</i> , shows how some features of Stonehenge were probably used to keep track of celestial events. Suggested use: Have students use this diagram to set up a "mini" Stonehenge in the classroom to determine various lunar and solar observing events. |
| Diagram | This illustration, from the article <i>Retrograde motion</i> , shows Ptolemy's early geocentric view of retrograde motion. Suggested use: Show this diagram while reviewing the terms <i>epicycle</i> , <i>equant</i> , and <i>deferent</i> . Have students explain how a planet moving in an epicycle (whose deferent circles Earth) would appear to move in Earth's skies. |
| Biography | Suggested use: Have students read this biography, and, referring back to the Ptolemy biography (see above), create a chart comparing the Copernican and Ptolemaic models of the universe. Then, pose the question of whether Copernicus really solved any issues, and, if so, which issues. Discuss whether there was enough evidence in Copernicus' time to support a heliocentric model. This biography details the meticulous observations of Tycho Brahe and the role that he played in influencing Kepler and others. |
| Biography | Suggested use: After assigning this biography as reading material, ask students to provide reasons why Tycho was not fully convinced of the Copernican model. Discuss the Tychoian model in which the Sun orbited Earth, but all the other planets orbited the Sun. Have students attempt to make a 3D model of such a compromised system. |
| Celestial Mechanics | |
| Diagram | This diagram from the <i>Planet</i> article illustrates the seven orbital elements that define the position of a planet in its orbit and the orientation of the orbit in space. Suggested use: Use the diagram as a starting point to review the orbital elements, which include the ascending node <i>N</i> , the descending node <i>N'</i> , the longitude of the ascending node, which is the angle Ω measured in the plane of the ecliptic from the vernal equinox ϵ , the orientation and size of the ellipse in the plane, and the position of the planet on the ellipse at any given time. |
| Table | This table from the <i>Planet</i> article summarizes orbital data from our own solar system. These data include distance from the Sun, period of revolution around the Sun, orbital velocity, orbital eccentricity, and orbital inclination. Suggested use: Based on data in the table, have students list a few characteristics that they think define the differences between Jovian planets (Jupiter, Saturn, Uranus, and Neptune), terrestrial planets (Mercury, Venus, Earth, and Mars), and dwarf planets. |
| Diagram | This simple diagram, from the article <i>Kepler's Laws</i> , illustrates Kepler's first and second laws, showing that when a planet moves along an elliptical orbit at a nonuniform rate, the radius vector drawn to the Sun sweeps out areas that are proportional to time; thus, the planet will take equal times to traverse unequal distances along the ellipse. Suggested use: Use this diagram to review Kepler's first two laws with students, pointing out that the Sun is at one of the two foci of the ellipse when it travels in its orbit, and that the planet moves faster when it is closer to the Sun than when it is farther away. |

1. View the list of available curriculum maps by subject, or view correlations to Next Generation Science Standards (for high school teachers)
2. Each curriculum map has an outline of available course topics, with specific content linked to each topic
3. The specific content is labeled by content type, and includes a detailed description with a direct link. Each item also has a suggested use for how it might be incorporated into a lesson or learning activity.

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.

To register for a free personal account:

1. Click on Your Personal Account from the homepage or any content page to open the sign-in window
2. Click Register, then fill in the form with your name, role, email address, and a password and accept the terms and conditions
*Check the box under email to receive periodic newsletter updates of new content and features
3. (Optional) Select topics of interest to receive email alerts when new content is added in those areas

Access your personal account by using the My Account link on the right sidebar or the My AccessScience link in the site footer.

Personal account features include:

4. Save individual items to your account or save searches and receive email alerts when new content is added relevant to that search
5. Filter your list of saved items by content type
6. Generate a citation or email a link to resources saved in your account. Items can also be removed from this list at any time.

Administration

The Administration portal contains a wealth of resources for using and promoting AccessScience at your institution.

Features of the Administration portal include:

1. Information on downloading usage reports and managing account information
2. Promotional materials to increase awareness of AccessScience at your institution
3. Embeddable search widget to include on your homepage or subject guides
4. View user guides, including an AccessScience LibGuide, and video tutorials with tips on navigating the site and resources for students and faculty
5. Links to register for upcoming AccessScience webinars, view recordings of previous webinars, or request a custom training session
6. Detailed FAQ help page with more information on the platform and solutions for common issues
7. Information on where to find McGraw-Hill Education at upcoming industry conferences
8. Footer links include a list of newly added content and contact form for any questions or feedback

AccessScience > For Admins

For Administrators

Welcome!

This page is designed to assist you in managing your AccessScience subscription.

1 Get usage statistics

Usage Statistics and Account Information

Your **Subscriber Services Portal** (SAMS Sigma) provides access to important tools for managing your institution's AccessScience subscription.

Need help? View instructions on how to login in and download usage statistics, or watch our brief video tutorial. A full SAMS Sigma User Guide is also available.

2 Get promo materials

Promoting AccessScience at Your Institution

Actively promoting AccessScience to your user community is essential to maintaining high usage and maximizing the value of your subscription. Available here are the **AccessScience brochure in PDF format**, as well as the **AccessScience search widget**. Other materials, including posters, bookmarks, and flyers, can be requested via email from our Marketing Department at digitalmktg@mhprofessional.com.

- Embed the AccessScience search widget in your LibGuide and/or library's web pages. Patrons will then be able to search AccessScience from those pages.

3 Embed our search widget

User Guides

View the **Quick Start Guide** for a brief overview of the content and features available on AccessScience, or use the **AccessScience User Guide** for more detail on navigating the site, content types, personal account features, and resources for faculty and administrators.

4 View user guides and video tutorials

Video Tutorials

View our brief videos for an overview of how to navigate the site and specific tips for students and faculty to get the most value out of using AccessScience.

Navigating the Site & Using Content

5 Attend a webinar or request training

Webinar Recordings:

All registrants will receive a recording of the webinar whether or not you can attend, and you can also view a recording of a recent webinars at the links below.

[AccessScience Site Overview Webinar Recording](#)

[AccessScience presents: Climate Change –Scientific Consensus and New Frontiers \(with Dr. Rachel Licker\)](#)

Custom Training:

If you have individuals interested in a training session, and our schedule does not accommodate yours, please contact userservices@mheducation.com. We will be happy to schedule a session at a time that's convenient for you.

6 Troubleshoot with our FAQs

Frequently Asked Questions

Our **help page** provides answers to many frequently asked questions regarding AccessScience. If you can't find an answer to your question, then please **contact us**, and we will respond to your inquiry as soon as possible.

7 Visit us at a conference

Conferences and Events

We will be at the conferences and events listed below. Please plan to stop by the McGraw-Hill booth to learn more about AccessScience, as well as our other latest products and offerings. To arrange an appointment at a conference, please contact digitalmktg@mhprofessional.com.

8 View new content or contact us

AccessScience New & Noteworthy **Get AccessScience** Connect

About
Articles
Briefings
Biographies
Media
Projects

Help/FAQ
For Faculty
For Admins

Contact Us
Troubleshooter Page

Mobile Access

Use AccessScience on your mobile device, tablet, or laptop even when not connected to your institution's network with the Roaming Passport feature.

1. View instructions and download the Passport from any page in the site using the "Get Off-Campus Access" link.
2. Save the passport to your device while connected to your institution's network and enjoy the freedom that mobile access provides



Please note:

- The lifetime of each Roaming Passport is six (6) months, after which you will need to complete the process again
- Logging out of the site will remove the Passport, requiring you to re-authenticate and download the Passport again
- Roaming Passports are only available for institutions that authenticate through an IP address and are not available to public library patrons

Need additional assistance?

Contact McGraw Hill's Customer Success team
at customersuccess@mheducation.com
for questions on using the platform,
requests for additional training, or
help with promoting usage at your institution.