

STATE LIBRARY
OF QUEENSLAND

Year 9 Physical Sciences

Cover: Selection of databases available through State Library, 2023.

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Teachers can advise students on State Library's resources and encourage their use to help with their studies and research. Students are encouraged to access State Library's resources at school, but not during class time.

Teachers are most welcome to advise students what is available via State Library, and to encourage students to make use of eBooks and databases to help with their studies. It is permissible for a teacher to demonstrate the use of State Library's catalogue, and to point out how various online material can be accessed.

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Overview

As Queensland's leading research library, State Library is a great place to find information to complete your research-based assessments.

State Library's One Search catalogue is the gateway to an extensive suite of national and international journals, databases, eBooks, encyclopedias, newspaper archives, and collections of thousands of historical images, letters, artworks, diaries, and artefacts to interrogate as sources.

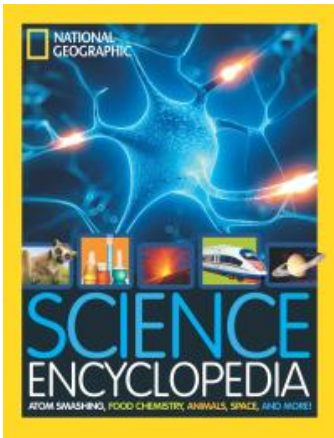
Before you get started

[Become a member](#) of State Library of Queensland (it's free!).

Once you have joined State Library, [log in](#) to your account in One Search so you can use the links in this research guide to access the featured collection items.

You can search our [OneSearch catalogue](#) or begin exploring by clicking on some of the featured items contained in this research guide.

E-Books



This is an advanced reading resource

[Queensland Museum](#) provide Learning Resources website students with many activities, fact sheets, images, and videos.

A screenshot of the Queensland Museum Learning Resources website. The header includes the Queensland Museum logo, the text 'Learning Resources', and navigation links for 'Home', 'About', and 'Save list'. Below the header is a search bar and several filter dropdown menus for '10 - 12', 'Physics', 'All types', and 'All museums'. A paragraph of text describes the resources available. At the bottom, it says 'Showing 6 of 6 resources' and shows three small thumbnail images of educational materials.

Conservation of Energy

Apply the law of conservation of energy to analyse system efficiency in terms of energy inputs, outputs, transfers and transformations.

- Explaining that the law of conservation of energy explains that total energy is maintained in energy transfer and transformation in a system.
- Explaining efficiency and recognising that in energy transfer and transformation a variety of processes can occur, so that the amount of usable energy is reduced and the system is not 100% efficient.
- Using and critiquing representations such as Sankey diagrams to show energy inputs, changes and outputs in a system.
- Investigating the efficiency of ground ovens used by First Nations Australians.
- Comparing the efficiency of electricity generation from coal and other sources such as nuclear, hydroelectricity, gas, solar and wind.
- Examining the meaning of energy star ratings given to appliances such as refrigerators and washing machines and criteria used to determine these ratings.
- Examining how improving efficiency in energy transfer and transformations in sporting activities such as pole vaulting or archery improves athletic performance.

[Oxford Reference](#) spans 25 different subject areas, bringing together 2 million digitised entries across Oxford University Press’s dictionaries, companions, and encyclopedias.

The screenshot shows the Oxford Reference search results page. At the top, the 'Oxford Reference' logo is on the left, and a search bar is on the right. Below the logo, there are navigation tabs for 'Subject' and 'Reference Type', and user account links for 'My Content (0)' and 'My Searches (0)'. The main heading is 'Oxford Reference Search Results'. On the left, there is a sidebar with 'Signed in as: State Library of Queensland' and a 'Narrow Your Choices' section with 'REFINE TERMS' set to 'All'. The main content area shows 'You are looking at 1-20 of 990 entries for: conservation of energy'. It includes a 'Did you mean' suggestion for 'conservation of mechanical energy, conservation of energy law' and a 'clear all' link. Below this, there are filters for '990 ENTRIES' and '6 BOOKS', and search options for 'View', 'Items per page: 20', and 'Sort by: Relevance'. The 'OVERVIEW' section for 'conservation of energy' lists the subject as 'Science and technology, Psychology' and provides a partial definition: 'When all the forces acting on a system are conservative forces, $E_k + E_p = \text{constant}$, where $E...$ '

The [Britannica Library](#) has articles, images and more, with a selection of resources especially for teenagers.

The screenshot shows the Britannica Library search results page. At the top, the 'Britannica Library' logo is on the left, and navigation links for 'SEARCH', 'Your Britannica Resources', 'Research Tools and Materials', 'Help', and 'My Britannica' are on the right. The main heading is 'You searched for "law of conservation of energy"'. Below this, it says 'DISPLAYING 1 - 10 OF 3,825 RESULTS.'. There is a 'Reading Level' filter set to '2' and an 'Advanced Search' link. The results are categorized under 'Articles', 'Images', 'Videos', and 'More'. The first result is 'conservation of energy (physics)', with a brief description: 'energy, conservation of | All of the changes that happen in the universe depend on energy. To cause a change to occur, energy may change form. For example, ...'. The second result is 'energy (physics)', with a brief description: 'energy | A rock falling off a cliff is different from the same rock lying on the ground below. A rubber band pulled taut is different from the same rubber ...'. At the bottom, there is a section for 'images related to this search:' with a 'See all images' link.

[JSTOR](#) provides access to more than 12 million scholarly journal articles and eBooks, and is especially good for primary sources.

The screenshot shows the JSTOR search results page for the query 'conservation of energy'. The page displays 193,287 results. On the left, there is a 'Refine Results' sidebar with options for 'ACCESS TYPE' (Everything, Content I can access), 'SEARCH WITHIN RESULTS', and 'CONTENT TYPE' (Academic content: Journals, Book Chapters, Research Reports; Primary source content: Serials). The main results area shows two journal articles. The first is 'The Conservation of Energy' by Scientific American, Vol. 56, No. 26 (JUNE 25, 1887), p. 401. The second is 'The Discovery of the Law of Conservation of Energy' by G. Sartori, J. R. Mayer, J. P. Joule, Sadi Carnot, published in Isis, Vol. 13, No. 1 (Sep., 1929), pp. 18-44. Each result has buttons for 'Download', 'Save', and 'Cite'.

[ProQuest Ebook Central](#) Compiles a library of topic specific ebooks for you to access free through your SLQ membership.

The screenshot shows the ProQuest Ebook Central search results page for the query 'Conservation of Energy, Physics'. The page displays 32090 book results. On the left, there is a 'Refine your search' sidebar with options for 'SORT BY' (Relevance), 'RESULTS PER PAGE' (10), 'BOOK STATUS' (Owned and subscribed to by my library, Unlimited Print, Copy, & Download, Course Reserve), 'YEAR PUBLISHED' (2024, 2023, 2022), 'SUBJECT' (technology & engineering / materials science / general, science / environmental science, science / physics / general, philosophy / general, science / general), and 'LANGUAGE' (English, German). The main results area shows three book results. The first is 'Six Easy Pieces : Essentials of Physics Explained by Its Most Brilliant Teacher' by Feynman, Richard P.; Leighton, Robert B. and more, published by Basic Books in 2011. The second is 'Statistical Physics of Biomolecules : An Introduction' by Zuckerman, Daniel M., published by Taylor & Francis Group in 2010. The third is 'Schrödinger's Cat Smile' by Curran, Gerard; Curran, Anabela and more. Each result has a book cover image, title, author, publisher, year, ISBN, edition, and a description. There are also buttons for 'Book Results', 'Chapter Results', and 'Available'.

Waves and Particles

Use wave and particle models to describe energy transfer through different mediums and examine the usefulness of each model for explaining phenomena.

- Describing the processes underlying convection and conduction of heat in terms of the particle model.
- Modelling the transfer of sound energy as waves using slinky springs and relating to the medium through which the sound is transferred.
- Examining how the particle model of electricity explains static electricity and electrical current and relating this to voltage, conductors and insulators.
- Discussing the wave and particle models of energy transfer, including the concept of photons, and how they are useful for understanding aspects of light and other forms of electromagnetic radiation.
- Investigating aspects of heat transfer and conservation in the design of First Nations Australians' bedding and clothing in the various climatic regions of Australia.
- Investigating the impact of material selection on the transfer of sound energy in First Nations Australians' traditional musical, hunting and communication instruments.
- Examining the forms of electromagnetic radiation that are used in different modern communication technologies and identifying any limitations.

[Oxford Reference](#) spans 25 different subject areas, bringing together 2 million digitised entries across Oxford University Press's dictionaries, companions, and encyclopedias.

The screenshot shows the Oxford Reference website interface. At the top, the 'Oxford Reference' logo is on the left, and a search bar is on the right. Below the logo, there are navigation tabs for 'Subject' and 'Reference Type', along with 'My Content (0)' and 'My Searches'. The main heading is 'Oxford Reference Search Results'. On the left, there is a sidebar with 'Signed in as: State Library of Queensland' and a 'Narrow Your Choices' section with 'REFINE TERMS' and a search box containing 'wave, particle, physics'. The main content area shows 'You are looking at 1-20 of 304 entries for: All: wave, particle, physics'. Below this, there are filters for '304 ENTRIES' and '1 BOOKS', and a 'View' section with 'Items per page: 20' and 'Sort by: Relevance'. The search results for 'string' are displayed, including a reference type of 'Overview Page' and a subject of 'Science and technology, Physics'. The description for 'string' is: 'A one-dimensional object used in theories of elementary particles and in cosmology (cosmic string). String theory replaces the idea of a pointlike elementary particle (used in quantum field theory) ...'.

The [Britannica Library](#) has articles, images and more, with a selection of resources especially for teenagers.

The screenshot shows the Britannica Library website interface. At the top, the 'Physics' section is highlighted, with 'DISPLAYING 1 - 10 OF 1,239 RESULTS.' below it. There are navigation buttons for 'Reading Level' (1, 2, 3) and 'Advanced Search'. Below the navigation, there are tabs for 'Articles', 'Images', and 'Videos'. The search results for 'light (physics)' are displayed, including a list of articles: 'Light— Wave or Particle?', 'Light: Wave and Particle', and 'Transverse Waves Explain Polarization'. Below the articles, there is a section for 'physics (science)' with a description: 'Without the science of physics and the work of physicists, our modern ways of living would not exist. Instead of having brilliant, steady electric...'. At the bottom, there is a section for 'images related to this search:' with four image thumbnails and a 'See all images' link.

[National Geographic Virtual Library](#) is a powerful tool for research offering access to over 100+ years of magazines and hundreds of books, maps, videos, and images.

The screenshot shows the National Geographic Virtual Library search interface. At the top, there is a search bar with the text 'particle, Physics' and a magnifying glass icon. Below the search bar, it says 'SHOWING RESULTS FOR' and lists content types: 'All Content Types' (selected), 'Featured Articles (2)', 'Books (4)', and 'Brief Articles (2)'. Under 'ALL CONTENT TYPES', there is a search term 'particle, Physics' and a 'Revise Search' link. The 'FEATURED ARTICLES (2)' section displays two articles:

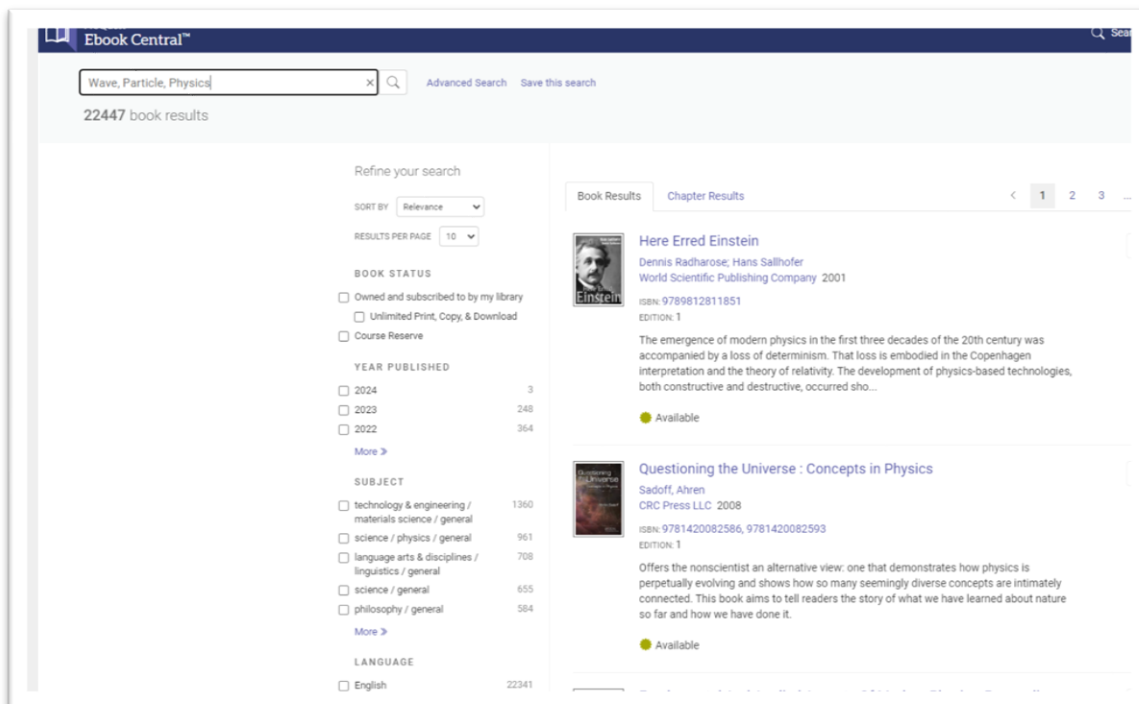
- At the Heart of All Matter: The God Particle**
Authors: Joel Achenbach and Peter Ginter
Publication: National Geographic Magazine
Mar. 2008 Volume 213, Issue 3 p. 90 Article
Found in National Geographic Archive 1995+
- Worlds Within the Atom**
Authors: Davis Meltzer, David Jeffery, Kevin Fleming, John Boslough, and Barron Storey
Publication: National Geographic Magazine
May 1985 Volume 167, Issue 5 p. 634 Article
Found in National Geographic Archive 1888-1994

[JSTOR](#) provides access to more than 12 million scholarly journal articles and eBooks, and is especially good for primary sources.

The screenshot shows the JSTOR search results page for 'Waves and Particles'. The page displays 18,129 results, sorted by Relevance. The left sidebar shows 'Refine Results' with filters for 'ACCESS TYPE' (Everything, Content I can access), 'SEARCH WITHIN RESULTS', and 'CONTENT TYPE' (Academic content: Journals, Book Chapters, Research Reports; Primary source content: Serials, Documents). The main results area shows two entries for 'Waves and Particles' by George P. Thomson:

- Waves and Particles**
George P. Thomson
Science, New Series, Vol. 70, No. 1823 (Dec. 6, 1929), pp. 541-546
...Waves and Particles : PROFESSOR GEORGE P. THOMSON 541 Scientific Apparatus and Laboratory Methods: "Vitality" Stains: ROBERTS RUGH. An Ichthy- The American Association for the Advancement of ometer: WARREN P. SPENCER: 556 T-e American A--s-sociation for the Adva-nce-me-nt of *ometer: WARREN P. SPENCER...
- Waves and Particles**
George P. Thomson
Scientific American, Vol. 143, No. 1 (July 1930), pp. 38-41
...C A M E R I C A N July 1930 Waves and Particles stresses in the ether." Now the ether has had a long and checkered history. * Ethers of a sort were common in early By Professor George P. Thomson t physica--rather too common. But the ether first acquired an assured...

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