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Science Reference Center

An Introduction

This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries, and the Commonwealth of Pennsylvania, Tom Wolf, Governor. © 2015 Hosted by HSLC

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What is Science Reference Center?

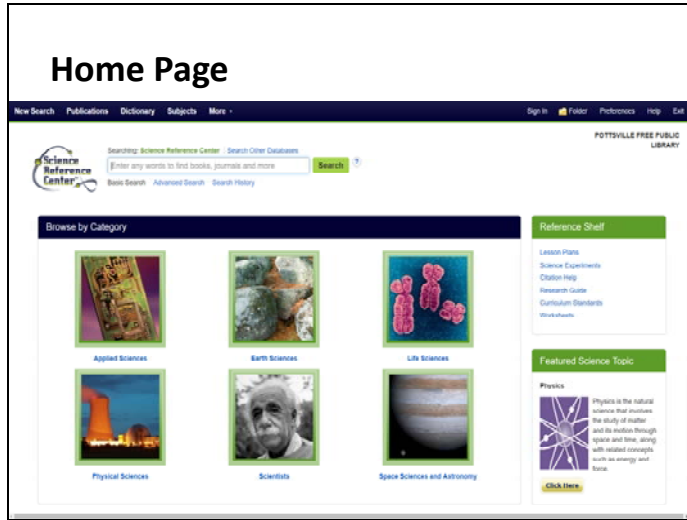
- A comprehensive research database that provides access to a multitude of full-text science-oriented content

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Science Reference Center Contains

- *Full text science reference books*
- *Full text science encyclopedias*
- *Experiments, activities and science fair projects*
- *Biographies*
- *And more*

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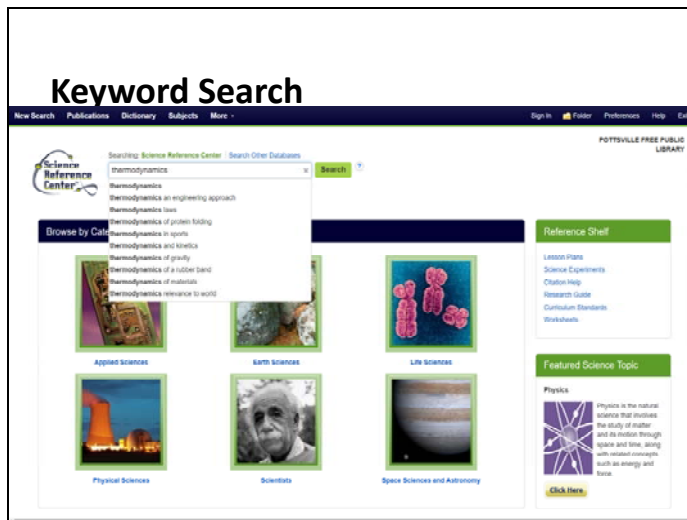


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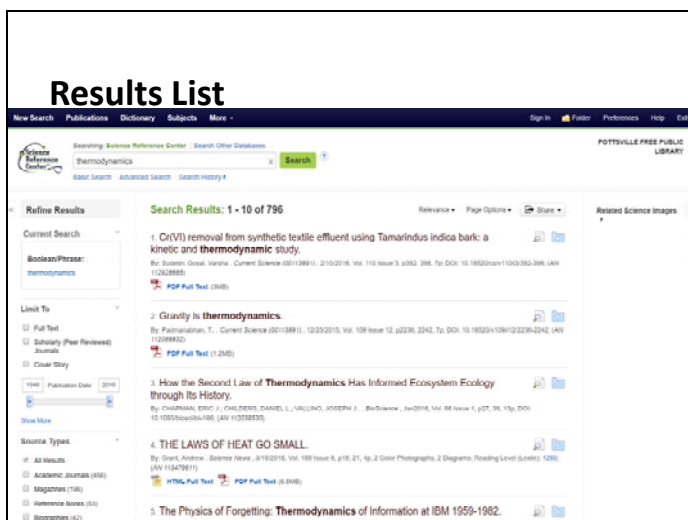
Searching Options

- Keyword Searching
- Browsing by Category
- Browsing Popular Sources
- Advance Searching

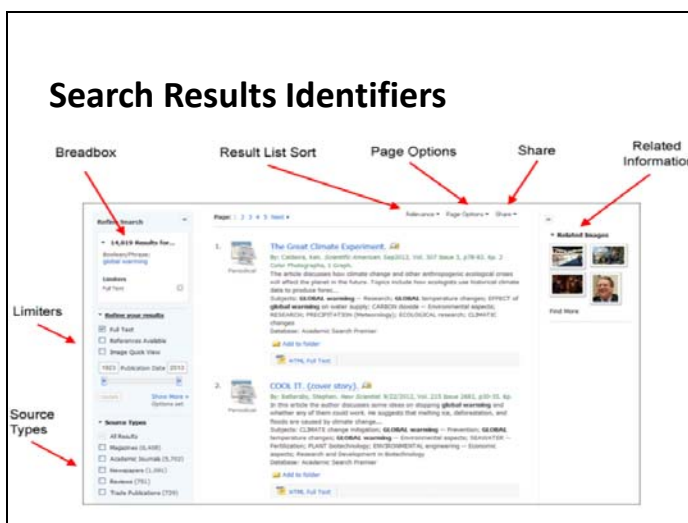
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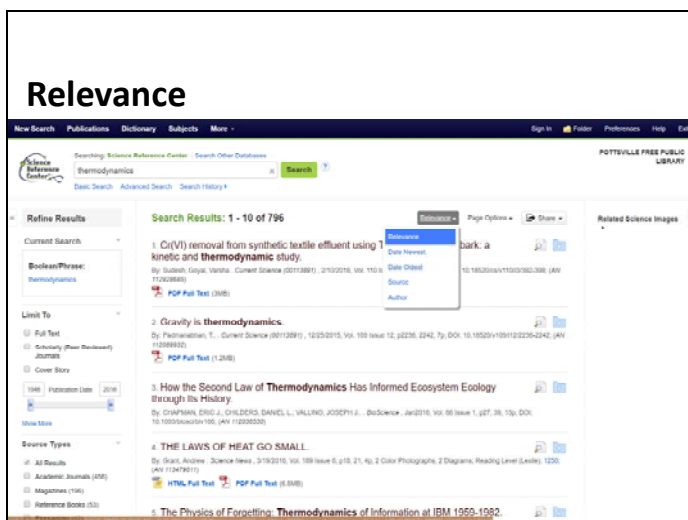
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Page Options

Page Options

Use this drop-down menu to customize how your result list page is displayed.

Note: The setting currently being used is highlighted with a yellow box.

To set your Page Options:

- Result Format** - Click the select a result list format.
- Image QuickView** - Select whether or not you would like thumbnails of images from your articles to display on the result list.
- Results per page** - Select the number of results per page you would like displayed.
- Page Layout** - Select your desired column layout for the Result List.

Result Format:

☒ Standard ☐ Title Only
☐ Brief ☐ Detailed

Image QuickView:

View thumbnails of the images in an article right from the Result List.

☒ On ☐ Off

Results per page:

Page Layout:

☒ 3 Columns ☐ 2 Columns
☐ 2 Columns ☐ 1 Column

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Share Menu

Share Menu

To use the Share menu:

- Add to folder** - Add all displayed articles to the folder or add the search to the folder as a persistent link to a search.
- Create an alert** - Create a search alert e-mail or an RSS feed right from the Result List, even if you are not signed in to My EBSCOhost.
- Use Permalink** - Highlight the link text and copy using your browser's copy function. You can immediately paste the link into a web site, document or e-mail.

You can also store links to your EBSCOhost pages to social bookmarking sites such as dig, del.icio.us, Technorati, bloglines, etc.

- Export Results** - If enabled by your administrator, click to email a link to download exported results.

Add to folder:

☒ Results (1-10)
☐ Add search to folder: global warming

Create an alert:

☒ E-mail Alert ☐ RSS Feed

Use Permalink:

Persistent link to search (copy & paste)
<http://product-view.epnet.com/webauth/>

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Single Result

4. THE LAWS OF HEAT GO SMALL.

By: Grant, Andrew . Science News , 3/19/2016, Vol. 189 Issue 6, p18, 21, 4p, 2 Color Photographs, 2 Diagrams; Reading Level (Lexile): 1250; (AN 113479611)

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Detailed Record

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THE LAWS OF HEAT GO SMALL

Authors: Grant, Andrew

Source: Science News, 3/19/2016, Vol. 189 Issue 6, p12-11, 1p, 2 Color Photographs, 2 Diagrams

Document Type: Article

Subject Terms: THERMODYNAMICS
 QUANTUM ENTANGLEMENT
 PARTICLES
 ENTROPY
 SECOND LAW of Thermodynamics

Abstract: The article explores thermodynamics in the quantum realm. It hopes to identify violations of thermodynamics' second law by exploiting the way quantum entanglement weaves with the fabric of a few particles. However, thermodynamics still rules despite simulating by well-aged tenets of heat, work and entropy. It is suggested that entangled particles someday could break the second law.

Lexile: 120

Full Text Word Count: 2027

ISSN: 0360-5315

Accession Number: 113479611

THE LAWS OF HEAT GO SMALL

Tools

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HTML Record

New Search	Publications	Dictionary	Subjects	More >	Sign In Faster Preferences Help Feedback
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**Science
Reference
Center**

Searching [Science Reference Center](#) Search Other Databases

(Thermodynamics) [X] Search

[Basic Search](#) [Advanced Search](#) [Search History](#)

POTTSVILLE FREE PUBLIC LIBRARY

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[▶ Result List](#) [Refine Search](#) [4 / 179](#)

Title: THE LAWS OF HEAT GO SMALL By Grant, Andrew. Science News, 02/08/42, 31(9)210-6, pp. 198. Reel 6

Database: Science Reference Center

THE LAWS OF HEAT GO SMALL

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Quantum physics Information storage Expand more

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[American Access](#) [▼](#)

Section:
Features

Physicists explore thermodynamics in the quantum realm

When French engineer Sadi Carnot calculated the maximum efficiency of a heat engine in 1824, he had no idea what heat was. In those days, physicists thought heat was a fluid called caloric. But Carnot, later lauded as a pioneer in establishing the second law of *thermodynamics*, didn't have to know those particulars, because *thermodynamics* is insensitive to microscopic details. Heat flows from hot to cold regardless of whether it consists of a fluid or, as we learn today, the collective motion of billions of molecules. *Thermodynamics*, the laws and equations governing energy and its conversion to work, concerns itself only with the big picture.

It's a successful approach. As *thermodynamics* matures, energy is always conserved (the first law), even if it flows from hot to cold to do work, arrives by the generation of disorder, or entropy (the second law). These laws allocate everything from the miles per gallon a car engine gets to the battery life of a smartphone. They help physicians better understand brain heats and why time moves forward (Bk. 7/29/13, p. 15).

"Yet the big picture approach, considering the forest rather than the trees, has made physicists wonder if *thermodynamics* holds at all scales. Would it work if an engine consisted of three molecules (hot to the typical trillion billion)? In the realm of the very small, governed by the quality rules of quantum mechanics, perhaps the *thermodynamics* code is not so tight.

"Thermodynamics was designed for big stuff," says Janet Anders, a theoretical physicist at the University of Eastern Finland. "We haven't really interpreted thermodynamics with quantum mechanics."

Tools

Add to folder

Print

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Cite

Export

Permalink

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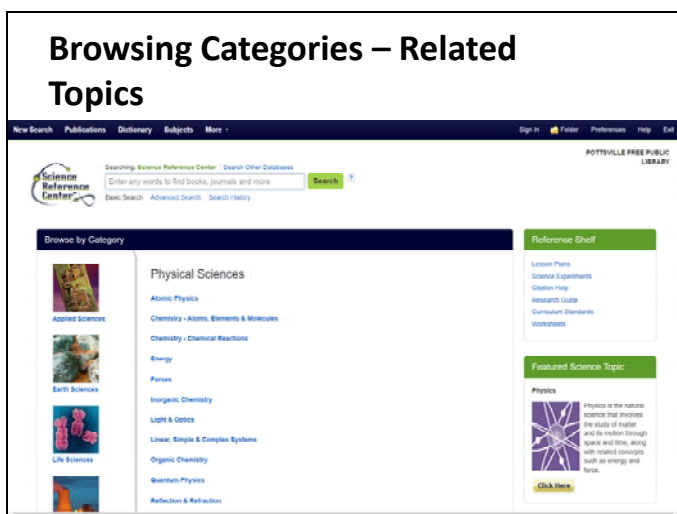
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[illegible]

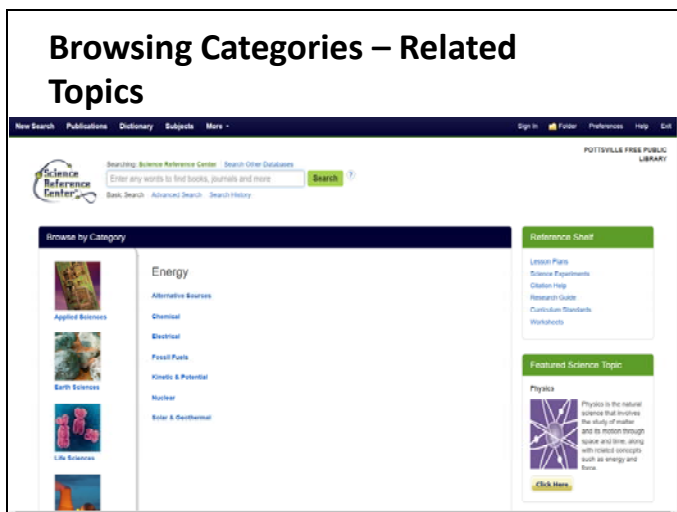
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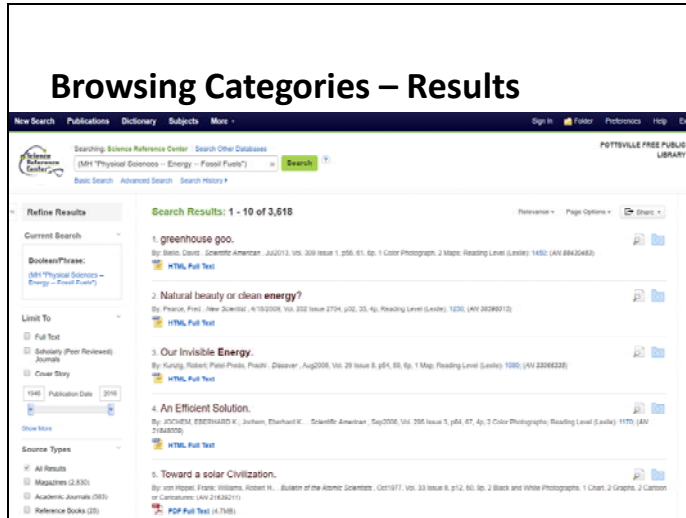
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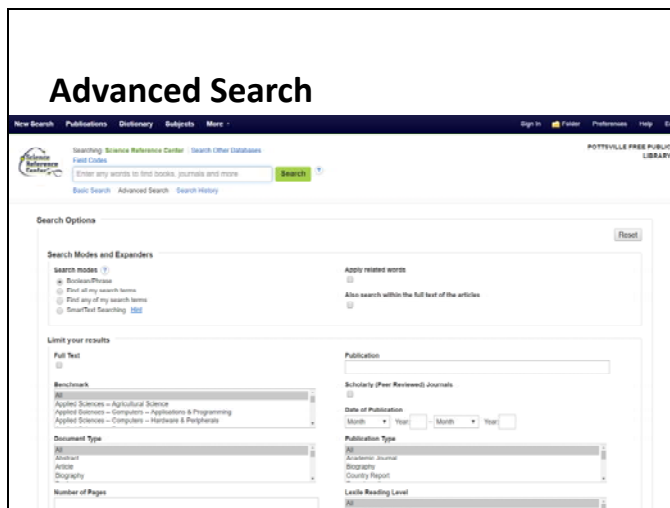
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Benchmarks

- Benchmarks are a standard or point of reference again which things may be compared or assessed.
- There are 80 benchmarks includes in this resource:
 - Applied (24)
 - Earth and Space (15)
 - Life (14)
 - Mathematics (9)
 - Physical Science (18)

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Science Experiments

- Science experiments can also be located using the Advanced Search
- For example:
 - Type Circulation in the Find Field
 - Select Grades 9-12 in the Lexile Reading Level
 - Select Science Experiment in the Document type

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Reference Shelf

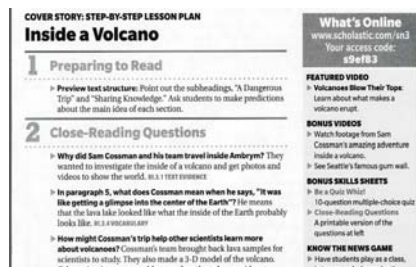
Reference Shelf

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[Science Experiments](#)
[Citation Help](#)
[Research Guide](#)
[Curriculum Standards](#)
[Worksheets](#)

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Lesson Plans

- Clicking on the link in the Reference Shelf will provide links to over 2,013 lesson plans.
- Lesson plans are in PDF format



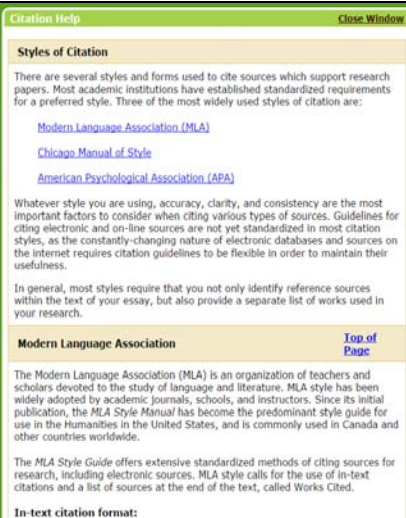
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Science Experiments

- View the 1,313 science experiments in one place
- In most cases, these are available in both HTML and PDF format.

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Citation Help



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Research Guide

Research Guide

Close Window

Guide to Research, Writing and Critical Reading

Science Reference Center provides virtually all the information you will need to effectively conduct research on science topics and write research papers. Because there is a wealth of information contained in this database, this guide is provided to support your research and writing process, helping you to write the best possible paper. The following guides and tools are provided:

1. [Plagiarism: How to Avoid Common Pitfalls](#)
2. [A Step-By-Step Approach to Writing Your Research Paper](#)
 - [Step One: Understanding the Scope of Your Assignment](#)
 - [Step Two: Choosing Your Topic](#)
 - [Step Three: Beginning Your Research](#)
 - [Step Four: Taking Notes](#)
 - [Step Five: Sorting Cards and Making a Working Outline](#)
 - [Step Six: Drafting - How to Integrate and Balance Your Paper](#)
 - [Step Seven: Revising](#)
 - [Step Eight: Editing and Proofreading](#)
 - [Creating a Schedule for Your Work](#)
 - [Some General Tips When Writing Your Research Paper](#)
3. [Worst Case Scenario: My paper is nearly due and I've barely started!](#)
4. [A Guide To Evaluating Information Sources For Your Research Paper](#)
 - [Information in Print and Online](#)

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Curriculum Standards

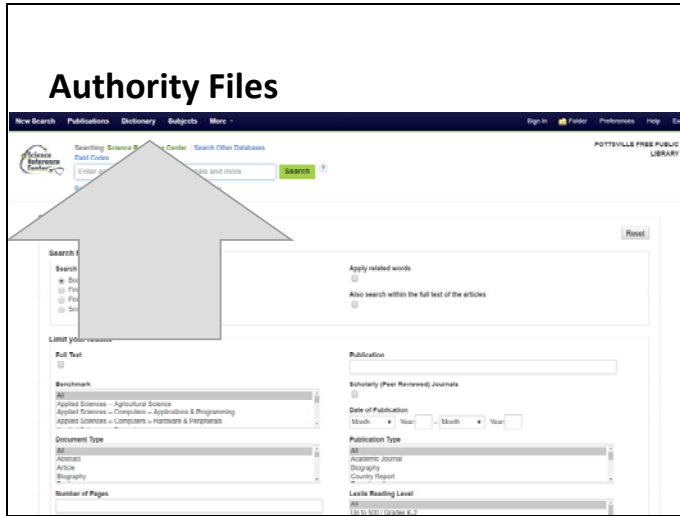
- Contains over 900 standards aligned to the curriculum for specific U.S. States.
- A standard will contain many educational benchmarks that an educator can use to build their lesson plans.
- Opens a module for searching on standard

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Worksheets

- Provides a static link for pulling up all the worksheets included with Science Reference Center.

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Publications

- This authority file allows you to search for specific publications found in Science Reference Center
- List publications alphabetically
- Provides access to all available volumes and issues of a selected publication

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Dictionary

- This link on the top bar provides access into the New Oxford American Dictionary.
- You can browse or enter a keyword for searching.
- Provides definitions and word origins

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Subjects

- Use this link to browse the subject terms assigned to all records found in Science Reference Center.
- Items are displayed alphabetically

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Images and Video

- This link allows you to search for videos or science images.
- You can refine your results by a specific collection.
