ProQuest COMPANY

PRESENTS

eLibrary Science

Teacher Research Activity Guide

1. **Content to Increase Student Achievement in Science**
2. **Digital Content that Keeps Textbooks Current**
3. **BookCart Power to Increase Teacher Effectiveness**
4. **Content to Support AP and Mainstream Courses**
5. **Content Dynamically Correlated to State Standards**

INCLUDES:

- **State Standards** and **Lexile** search tools to help teachers create custom Science BookCarts
- Digital information literacy skills to increase critical thinking in Science
- Support for new No Child Left Behind testing in Science
- Scientific-based research on inquiry-based learning and increasing student achievement
- *Topic Searching* provides access to thousands of **Editor's Choice** Science websites
- Teacher *Publication B*rowsing for lesson enrichment and keeping textbooks current

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eLibrary Science Tools and Content to Help Students Increase Achievement

One-Stop Searching for Science Information—eLibrary Science consists of a variety of science magazines, journals, photos, transcripts, books, multimedia, and websites. It also provides resources for the AP science students as well as for the more mainstream students studying science. Every search on eLibrary Science automatically looks for and accesses information simultaneously from all these media resources unless a teacher or student limits their search. To save searching time and provide for greater student relevancy of results, teachers and librarians may elect to build **standards-based BookCart collections**. ProQuest has already created more than **85 model BookCarts that can be copied and adapted** to state standards, reading levels, and the science curriculum. Many BookCarts are linked to curriculum guides that help teachers create, manage, and evaluate mini-research activities based on the resources included in these BookCarts.

World-Class Learning Resources and Media Variety

1. **Magazines and Journals (*)** — 260+ that are most useful for researching information on a variety of interesting current topics: the human genome; global warming; nanotechnology; journals are particularly valuable for science fair projects and AP courses
2. **Photos—(1000s)**—with captions, support almost all types of research; included are satellite photos of earth, as well as a variety of earth life forms; most useful in PowerPoint presentations
3. **Transcripts (*)**—useful for current events and especially interviews of scientists in many fields (primary resources)
4. **Books (*)**—50+ can be accessed through the Reference tool while reading a document online
5. **Audio-Visuals—(100s of hours)**—students learn best when appropriate images and sound accompany information and concepts. Teachers can integrate these into lesson presentations.
6. **Editor's Choice Websites—30,000)**—these websites are selected and organized using the curriculum correlated Topic Tree with 9 science topic areas. Topic searching beats Googling to reduce time spent in searching for relevant and authoritative information.

(*) To get the publication list and quantities for eLibrary Science, double click on the icons for each of these products on the main search page. A list of publications by *science subject areas* is available at http://www.proquestk12.com/pic/pdfs/eLibraryScienceContentbySubject.pdf

Unique and Powerful Student Tools to Increase Achievement

Spell Checker for Successful Starts and Great Results—This support tool helps solve one of the **most troublesome problems** for student researchers (and teachers too), lack of results due to misspelled key words used in searching. Spell check helps students avoid the initial frustration and subsequent lack of quality results necessary for successful research activities.

Reference Tool for Increased Understanding—This learning tool integrates a dictionary, thesaurus, almanacs, encyclopedias, and other **science reference** books to help students to understand the information in the documents that they open and read from the *Results List*. When student encounter a word that they need to know the meaning of, they can highlight the word and click the Reference tab to get an instant definition. Students may also want to know more about words they already understand. Learning is increased when students have **on-demand help** in understanding and/or expanding what they are reading.

MyList to Organize Learning—This organization tool helps students to collect up to 25 documents for **saving, emailing, or printing** for later use in producing a works cited list (bibliography) for science projects and reports. This time saver for routine tasks increases the time for reading, writing, and critical thinking.

BookCarts to Customize Learning—Students can save time looking for relevant information by accessing teacher and librarian built custom BookCart collections of learning resources. Teachers **save class time** usually wasted by students in surfing for relevant and authoritative learning resources. BookCarts ensure student focus on topic-relevant and authoritative learning resources that are correlated to **state standards** and **appropriate Lexile reading levels**. BookCarts also contain a variety of media resources, including websites to address **student multiple learning styles**.

Best Part Supports Quick and Accurate Relevancy Decisions—Allows students to **judge relevancy more quickly** by fast-forwarding to the most keyword-dense section of the article, saving valuable student and teacher classroom time.

Remote Access for Greater Learning Opportunities—Students can access eLibrary resources and custom BookCarts, anytime and anywhere. Students learn best when they have the flexibility and the interest to learn. Students can learn when they are sick, on vacation, or on other occasions when they are not at school, unlike with traditional print resources which may be in short supply or obsolete, especially in science.

Appropriate Reading Levels to Increase Understanding—Students can search or sort by **Lexile** reading levels so that learning resources match their reading levels to ensure greater understanding and increased achievement.

Emailing Saves Time and Increases Collaborative Learning—Students can email their selected documents from ***My List*** from the school to their homes to facilitate working on their mini-research reports. They can also share documents with other students when the teacher strategy includes team mini-research activities.

Variety of Resources in One Search Saves Time—Topic search of the **Science topic tree** accesses more than 30,000 Editor's Choice websites and a variety of relevant documents and other media from eLibrary and eLibrary Science in the same search.

Current Science News, Famous Scientists, This Day in Science—Students are connected to **daily real-world news** from the world of science and technology and also to historic news to motivate their study of science and understand its importance to progress in the world.

Interactives Aid Understand of Difficult Concepts—More than 40 (and growing) interactive science and math models provide for easier understanding of **abstract concepts** through use of **visual and dynamic models**. Research has shown that interactive models increase understanding of difficult concepts better than static and verbal models.

eLibrary Science Tools and Content to Increase Teacher Effectiveness

The Power of Custom BookCarts—Teachers can save classroom and library time searching and ensure quality information for quality research projects by creating ***custom*** BookCarts for their students to use. BookCarts can be customized by (a) Lexile reading levels, (b) state standards, (c) AP or regular course, (d) high school or middle school, (e) contain a variety of media with a variety of viewpoints. http://www.proquestk12.com/lsm/pqelib/pdfs/bookcartsqsg.pdf

ProQuest Science BookCart Collection—ProQuest has already created more than 85 model science BookCarts for teachers to copy and adapt for many of the topics and issues that are already part of the curriculum in their subject. Teachers can get started on research projects *right away* and not have to wait to build their own BookCarts. Using ProQuest models also helps teachers to learn how to create quality BookCart collections and share them with other science teachers during in-service days. The link to the list for copying: http://www.proquestk12.com/pic/pdfs/eLibrary_Science_BookCarts.pdf http://www.proquestk12.com/demo/PQBC_CopyingDemo.viewlet/PQBC_CopyingDemo_viewlet_swf.html (How to copy link)

State Standards Search to Auto-Build BookCarts—State standards search provides links to dynamically correlated resources that can be **automatically** imported into BookCarts using **My List**.

Keep Science Textbooks Current—Most school science textbooks are about 5-6 years old. In science, this is a significant detriment because new discoveries obsolete much of what is in these textbooks, especially in applied science. Teachers can update their textbook information by using *Publication search and browse* to read the most current magazines and journals in their subject area. They can also print and make classroom copies for student notebooks that help expand the textbook. Teachers can access a copy of eLibrary Science publications by subject area at this site: http://www.proquestk12.com/pic/pdfs/eLibraryScienceContentbySubject.pdf

Teachers Help More Students without Supervising Student Internet Surfing—eLibrary Science contains 7 media types and science websites organized by a science *Topic Tree*. One search access all these media types saving classroom and library time. All information is authoritative and relevant ensuring focused project results. No surfing and Googling to waste time, get stuck with dubious information, and have to worry about students playing games and visiting inappropriate websites.

Home Access—Teachers usually have very little time in school to use eLibrary and create custom BookCarts, or update their textbook knowledge and resources. Home access provides the resources for essential lesson planning and BookCart building and adapting.

Resources for Honors/AP Courses and for Mainstream Courses—The content in eLibrary Science includes publications that support Advances Placement and Honors courses as well as mainstream science courses. One resource also supports all secondary students as well as teachers.

Teacher Publications—eLibrary Science contains specialty magazines for written for teacher in Biology, Chemistry, Environmental, Technology, and General Science.

Interactives to Support Learning Abstract Concepts— More than 40 (and growing) dynamic interactive science and math models that make the teaching of abstract concepts more effective.

Science News as a Bridge to Real-World Application of Science—Science teachers will appreciate this daily news tool to help them help students understand how the science they learn in school is impacting the lives of people around the world.

What Does Scientific-Based Research Indicate About the Use of eLibrary Science with Mini-Research Activities?

The following list of statements summarizes some of what we know **works in the classroom** and what we know about how students learn:

Scientific-Based Research Guide: (Summary of scientific research proves that mini-research activities with eLibrary increases student achievement in essential skills)
http://www.proquestk12.com/lsm/pqelib/pdfs/SBReLibTeacherTraining.pdf

Students learn better when information is applied through activities that integrate higher-order thinking skills.

The ProQuest mini-research process focuses teachers and students on higher-order thinking skills. Instead of "who, what, when, where" research, students are motivated by teacher assignments that focus on **"why, how, why not, and what if"** research challenges that integrate Bloom's taxonomy.

The Engaging Issues for Student Mini-Research Guide provides over 40 science and technology topics/issues and accompanying BookCarts for research that help develop critical thinking skills.
http://www.proquestk12.com/pic/pdfs/engageissuesbcguide.pdf

Students learn better when appropriate visuals are integrated with information.

Most learners are visual learners. With eLibrary Science teachers and students can access thousands of photos, multimedia clips, and Editor's Choice websites related to topics that they are studying and then integrate these visual resources into their reports, science fair projects, and presentations.

Students learn better when a variety of activities and assessments are part of the learning experience.

Research shows that students have *multiple learning styles* and need multiple ways of learning and expressing their knowledge and opinions. Research activities provide the opportunity for students to demonstrate what they know through writing, oral or PowerPoint presentations. Research activities can also be organized collaboratively so that students learn to work together and can also learn from each other.

Students learn better when they have an opportunity to construct knowledge from information related to a relevant issue.

Information is not knowledge. Scientific research shows that information must be must be constructed into knowledge through motivating and authentic learning activities such as researching science issues that are relevant to a student's life and experiences. ProQuest guides provide resources designed to help teachers create these activities.

Students learn to read and write better when reading and writing activities are related and integrated.

Reading and writing are symbiotic—they reinforce each other. These essential language arts skills can be integrated effectively using ongoing research activities. These activities also help build knowledge and understanding in the core curriculum content subjects. **If you can't write it, you don't really know it.**

Reference integrates a dictionary, thesaurus, and age-appropriate encyclopedia and science reference books to provide the opportunity for students to get on-demand feedback on troublesome words that interfere with understanding or on words that invite interesting sidebars for learning.

Students learn to write better when they are asked to present "reasoned opinions" or defend/refute a position on science issues that are relevant to them.and require original thought

Mini-research activities provide an opportunity for students to do expository and persuasive writing. Organizing, analyzing, and then synthesizing what they have learned into "reasoned opinions." The ability to form "reasoned opinions" and deciding what information is relevant and accurate is essential for student success in secondary education, college, careers, and life.

Students learn better when TIME ON TASK is increased and not wasted in unessential activities.

eLibrary Science provides 6 learning media selected specially for secondary students and teachers. Each user can get and organize all the information that they need in a single effort. Students can access information from home or at school. Time and the frustration of searching in multiple places are minimized, conserving time and energy for critical thinking activities. *Spell Check*, *My List*, *Sort by Reading Level*, and teacher *BookCarts* are new tools designed to save searching and collecting time.

Students learn better when parents are involved with their school and homework.

Home access **helps parents to get involved** with research learning activities, whether assigned or **motivated by extra credit** opportunities. Teacher can create BookCarts customized to address **student enrichment** or **remediation**. Parents can see these BookCarts and assignments that support their children's learning. Second only to teacher quality, **parental involvement** in student learning is the next factor used to predict student achievement.

Students learn better when they have access to a variety of world-class resources.

Teachers and librarians have always tried to enrich textbook teaching with a variety of additional resources for in-depth learning. Unfortunately, not many students and teachers are fortunate enough to attend schools with current and high quality library and classroom science learning resources. eLibrary Science provides the content and tools for teachers and students to stay current in the world of science. Most of the science information cannot be found by searching the Internet because it comes from copyrighted books, journals, and magazines. Home access provides learning opportunities anytime and anywhere with an Internet connection.

Searching the Science Topic Tree Yields Both Editor's Choice Websites and Documents

- Earth Sciences
  - Climatology
    - Ecology
    - Environmental Studies
    - Featured Topics
    - Geology
  - Hydrological Sciences
  - Introduction
  - Meteorology
  - Paleontology
  - Resources
  - Space Exploration

- Featured Scientists
  - Banting, Sir Frederick Grant
  - Becquerel, Antoine Henri
  - Bohr, Niels
  - Celsius, Anders
  - Curie, Marie
    - Dalton, John
    - Darwin, Charles
    - Einstein, Albert
    - Fossey, Dian
    - Franklin, Rosalind E.
    - Freud, Sigmund
    - Goodall, Jane
    - Lavoisier, Antoine
    - Leakey, Mary
    - Leeuwenhoek, Anton Van
    - Mayer, Maria Goeppert
    - McClintock, Barbara
    - Mead, Margaret
    - Mendel, Gregor
    - Newton, Isaac
    - Nightingale, Florence
    - Pasteur, Louis
    - Pauling, Linus
    - Pavlov, Ivan
    - Roebling, John
  - Sabin, Albert Bruce
    - Walker, Mary
    - Wohler, Friedrich
    - Yalow, Rosalyn

- Health Sciences
  - Fields of Medicine
    - Fitness & Exercise
    - Health Issues
    - History of Medicine & Health
    - Illness & Disease
    - Other Fields
    - Resources
    - Special Topics
    - The General Study of Medicine

- Introduction
  - Activities
    - Classification in Science
  - Communicating Scientific Results
  - Data Collection
  - General Science News
  - Lab Procedures
  - Lab Safety
  - Logic & Critical Thinking
  - Other
  - Relationship Between Science & Technology
  - Responsible Science
    - Science Projects
    - Scientific Equipment
    - Scientific Inquiry
    - Scientific Investigation
    - Scientific Method & Tools
    - The Basics of Science

- Life Sciences (Biology)
  - Animal Sciences (Zoology)
    - Biochemistry
    - Biotechnology
    - Cellular & Molecular Biology
    - Classification of Organisms
    - Ecology
    - Evolutionary Biology
    - Featured Topics
    - Introduction
    - Marine Biology
    - Medical Sciences
    - Microbiology
    - Neurobiology
    - Other Fields
    - Plant Sciences (Botany)
    - Resources

- Physical Sciences
  - Astronomy
    - Chemistry
    - Physics
    - Resources

- Resources
  - Calculators
    - Conversion Tables
    - Encyclopedias
    - Glossaries & Dictionaries
    - Image & Atlas Gallery
    - Libraries & Archives
    - Museums
    - Periodicals
    - Science Careers
    - Units & Measurements

- Science Projects
  - Experiments
    - Games
    - Other
  - Projects

- Science in the World
  - Animals & Scientific Research
    - History of Science
    - Nobel Prizes for 2003
    - Science & Society
    - Science 2002
    - Scientists

- Technology
  - Agriculture
    - Biotechnology
    - Computers
    - Energy
    - Engineering
    - Ergonomics
    - Governmental Policy on Technology & Science
    - Introduction
    - Inventors & Inventions
    - Manufacturing
    - Medical Technology
  - Microscopy
  - Mining
  - Other Technologies
  - Resources
  - Space
  - The Future
  - Timber/Lumber
  - Transportation

Science & Technology Skills and Content Standards

eLibrary Science supports all included **skills and content** standards. But **bolded standards** or **parts of standards** indicate that eLibrary Science resources are essential for success because they provide the currency, need for multiple points of view, or timely access to a variety of media that are not readily available in most schools, libraries, or at home. Standards shown are summarized from McREL standards (www.mcrel.org)

Typical Science & Technology Standards

SKILLS AND PROCESSES—students will explain how the nature of science has affected scientific inquiry, technology, and the history of science.

- **Access and process information** in order to formulate questions that lead to a testable hypothesis, which demonstrates the logical connections between the scientific concepts and the design of an investigation
- **Defend a position on a scientific issue** and take into account the different types of risks and benefits in formulating a plan of action
- **Critique** scientific information in order to **detect bias** and **analyze the bias source**
- Demonstrate and explain how using existing tools extend knowledge and identify the limitations, which drive the need for new technologies
- Explain that science and technology have strongly **influenced the course of history** and cite how human inventiveness has brought **new risks** as well as **improvements to human existence**
- Describe how **various cultures**, over time, have made contributions that **led to current scientific ideas and technological invention**
- **Explain that scientific careers** differ from one another in what is studied, techniques used, where studied, and outcomes sought but they share a common purpose and philosophy and are part of the same scientific enterprise

More than 80 eLibrary BookCarts have been created to facilitate inquiry activities in science and science-related topics and issues that require critical thinking and investigation. Use BookCart Editor to copy these BookCarts into your school eLibrary Science site. Here are the links to the resources that you will need:

BookCart List: http://www.proquestk12.com/pic/pdfs/eLibrary_Science_BookCarts.pdf

BookCart Editor Guide: (multimedia version)
http://www.proquestk12.com/lsm/pqelib/flash/eLibBookcarts.viewlet/eLibBookcarts_viewlet_swf.html

Engaging Issues Mini-Research Guide:
http://www.proquestk12.com/pic/pdfs/engageissuesbcguide.pdf

Science in the News—This feature provides daily looks at science and medical news headlines from around the world. Teachers and students can use this information to connect to chemistry, biology, physics, earth, and space science course topics that they are studying. Scientific research on learning proves that student learn more when what they study is connected to real-world topics in which they have an interest. Listed below is a sample of headlines that may be opened for further reading and possible research activities:

1. Dr Gareth: Casebook A-Z: M is for mumps
2. CO2 AMONG THE GASES HEATING ATMOSPHERE
3. Human Papillomavirus; Vaccine against virus causing cervical cancer and genital warts shows promise
4. Guarding against flu
5. DID YOU KNOW?
6. Vancouver, B.C. to Host the 22nd International Papillomavirus Conference and Clinical Workshops
7. HOME / pests: Carpenter ants have a thing for wood
8. Deadly virus outbreak under control in Angola
9. Virus under control
10. Ebola: virulent killer virus, and there's no weapon in the doctor's bag

Science Fair and Science Project Support—The science Topic Tree search includes subtopic branches that links to hundreds of articles and websites that provide information, ideas, and strategies that support a variety of classroom and **science fair projects**. They also support ideas for **experiments** and **games**. Each subtopic list of websites also includes hundreds of articles. Here is an sample of some websites.

Editor's Choice Websites for Projects:	**Editor's Choice Websites for Experiments:**
Resources for Science Fairs & Projects	Experiments & Activities
Science Projects Resources Guide	Home Experiments
The Science Club Science Projects	Explore Science Interactive Experiments & Games
Build a Solar System	Funology.com: The Laboratory
Create Puzzle Pictures	Home Experiment Index
Database of Student Research Projects	
Energy & Science Projects	**Editor's Choice Websites for Science Games:**
Math Projects for Science Fairs	Create & Play -- Learning Games
Science Made Simple	Environmental Games & Activities
Science Projects in Agriculture	Science, Environment, & Health Word Scrambles!

Each of the **science standards content areas** on the following pages is dynamic and requires current resources beyond the textbook and requires knowledge from current sources to understand how new knowledge and old knowledge interface to provide a better understanding of our world. **Bolded parts of standards indicate the need for the currency of eLibrary Science resources**.

Typical Science Content Area Standards

EARTH/SPACE SCIENCE STANDARDS—Students will use scientific skills and processes to explain the chemical and physical interactions (i.e., natural forces and cycles, transfer of energy) of the environment, Earth, and the universe that occur over time.

- Materials and Processes That Shape A Planet—Explain how formation, weathering, sedimentation, and reformation of rock constitutes a continuing "rock cycle"
- Earth History—Use absolute dating, superposition, and fossil correlation to explain the sequence of events, which make up Earth's **biologic and geologic history**
- Plate Tectonics—Describe Earth's surface in reference to plate tectonics (i.e. internal heat flow and the **dynamic nature of Earth's crust**)
- Astronomy—Identify and describe the properties, interactions, and the **theories formation** of the universe and its components (e.g. **stars, planets, comets, meteors asteroids, and galaxies**)
- Interactions of Hydrosphere and Atmosphere—Analyze the major components of the atmosphere and hydrosphere and explain how the transfer of energy through them **influences Earth's weather and climate**

Topic Search Example for Editor's Choice Websites and Relevant Articles

Topic = Earth Sciences >>Hydrological Sciences >> Oceanography

El Nino

Data
Forecasts & Reports
Images
Impacts
Introduction
Other
Recent News
Research

Introduction

La Nina

Data
Forecasts & Reports
Images
Impacts
Introduction
Research
Special Topics

Marine Life

Aquaculture
Common Types of Saltwater Fish
Coral Reefs
Crustaceans
Deep Sea Animals
Echinoderms
Eels (Anguilliformes)
Fish Species Listings
General
Jawless Fishes (Agnatha)
Marine Mammals
Mollusks
Other
Rays & Skates
Sea Turtles
Seahorses & Sea Dragons
Sharks

Museums/Aquariums/Expeditions

Ocean Floor Mapping

Oceans

Basics & Overviews
Carbon Cycle
Conservation
Coral Reefs
Currents
Earth's Oceans
Earth's Seas
Resources
The Deep Sea

Research & Reference

Oceanography
Maps, Models & Exhibits
Oceanographers
Research Facilities & Ships
Societies
Satellite Oceanography

Tides

Prediction Tables
Tides Basics & Overviews

Keyword Searches Accesses 300+ Science Publications and Articles

Processes that Shape the Earth

Search: tectonic plate theory
Search: causes of volcano eruptions
Search: fossils show the changes in the earth
Search: coral reefs creation

Earth and Space

Search: sunspots affect the earth
Search: neutron star
Search: gravity bends light rays
Search: light photons

Publication Searching for Multimedia and Graphics for Presentations

Both students and teachers will increasingly need access to rich multimedia resources to integrate into lesson presentations and student reports. eLibrary Science provides a robust collection of these resources.

Astronomy	A.D.A.M. Animation Library
Earth Explorer	APlus Student Video
Earth Life Forms	Hutchinson's Encyclopedia
Earth Life Forms--Animals	LifeStory Publications Videos
Eye on Nature	Mathrealm Interactives
NOAA Photo Library	Science News

Publication Searching for Lesson Plan Enrichment and Student Notebooks

Publication browsing of more than 260 current science magazines and journals provides the teacher with an easy way to update their knowledge beyond the textbook and then include the ***current*** information in lesson plan activities. **Printing selected articles and making copies for student notebooks** is an easy way to keep a textbook current and enrich student learning by building a notebook of significant articles.
List of publications by subject:
http://www.proquestk12.com/pic/pdfs/eLibraryScienceContentbySubject.pdf

To browse any publication on the list above:

1. Scroll down the search page to *Advanced Search* options
2. Type the name of the publication in the *Publications* box
3. Scroll up to the *Search* box and leave it blank (no text)
4. Click the *Search* button

Sample of *State Standards Search* in Earth Science

Teachers can use the **State Standards** search tool which is accessed at the bottom of the Search page. This tool provides articles and websites correlated directly to the state standard selected in the following search procedure:

Standards: Search by national/state standards  **Click this Link**

- After selecting the state and science subject area, teachers scroll through the standards and click on the specific standard for which they need resources.

Clicking on See Resources Automatically Searches for Correlated Resources for BookCarts

Earth Sciences

Earth's Place in the Universe

Dynamic Earth Processes

3. Plate tectonics operating over geologic time has changed the patterns of land, sea, and mountains on Earth's surface. As the basis for understanding this concept:

a. Students know features of the ocean floor (magnetic patterns, age, and sea-floor topography) provide evidence of plate tectonics. See resources

b. Students know the principal structures that form at the three different kinds of plate boundaries See resources

- After clicking **See resources**, teachers can review a Results List of **topics and subtopics links** that can be searched to provide relevant articles and websites.

Samples of Topic and Subtopic Links to Articles and Websites

Earth Sciences >> Geology >> Physical Geology >> Earth Processes >> Earthquakes >> Seismology (Earthquake Research)

Earth Sciences >> Geology >> Physical Geology >> Earth Materials & Structures >> Layers of the Earth

Earth Sciences >> Geology >> Physical Geology >> Earth Processes >> Plate Tectonics & Continental Drift >> Plate Tectonics >> Animations & Illustrations of Moving Plates

Earth Sciences >> Geology >> Physical Geology >> Earth Processes >> Plate Tectonics & Continental Drift >> Continental Drift

- Any articles and websites on the **Results List** derived from one of these subtopic searches can be automatically imported into a BookCart using **My List** and the **Add to New BookCart** tools. http://www.proquestk12.com/lsm/pqelib/pdfs/bookcartsqsg.pdf

LIFE SCIENCE/BIOLOGY STANDARDS—Students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.

- Cellular—Explain that most life functions involve chemical reactions regulated by **information stored within the cell** and may be influenced by the cell's response to its environment
- Genetics—Explain how traits are inherited and passed from one generation to the next (i.e. from parental **DNA**, RNA to gross anatomical traits of offspring)
- Evolution—Analyze the mechanisms of evolutionary changes (e.g., genetic variation, **environmental changes**, and natural selection)
- Biochemistry—Explain the correlation between the structure and function of **biologically important molecules and their relationships to life processes**
- Ecology—**Analyze the interdependence** of diverse living organisms and their **interactions** with the components of the **biosphere**

Topic Search Example for Editor's Choice Websites and Relevant Articles

Topic Search =	**Life Science >>Biology >>Biotechnology**	
Basics & Overviews	Monoclonal Antibodies	
History of Biotechnology	Protein Engineering	Regulations & Policies for Biotechnology
Introduction to Biotechnology	Recombinant DNA Technology	
Introduction to DNA		
Structure & Function of DNA		**Types of Biotechnology**
Cryobiology	**Other**	
Cryogenics	Biological Warfare	Agricultural Biotechnology
Cryonics	Xenotransplantation	Animal Biotechnology
Genetic Engineering		Food Biotechnology
Basics & Overviews		Plant Biotechnology
Cell & Tissue Culture	**Reference**	
Cloning	Glossaries	
Ethics & Issues	Images	
Gene Transfer (Therapy)	Periodicals	
Genetic Engineering News		

Topic Search = Health Sciences		
Fields of Medicine	**Health Issues**	**Other Fields**
Anesthesiology	Aches, Pains & Illnesses	Alternative Medicine
Cardiology	Alcohol & Drinking	Dentistry
Dermatology	Drugs	Nursing
Endocrinology	First Aid	Pharmacy
Gastroenterology	Regulation & Health Advertising	Physical & Occupational Therapy
Immunology	Safety	Physician Assistant
Nephrology	Smoking	Podiatry
Neurology		Veterinary Sciences
Obstetrics/Gynecology	**History of Medicine & Health**	
Oncology	Ancient Medicine	**Special Topics**
Ophthalmology	Leaders	Animal Testing
Orthopedics	Overview of the History of Medicine	Disease Prevention
Otorhinolaryngologist		General Drug Information Materials
Pediatrics	**Illness & Disease**	Health Enhancement: Verbal &
Psychiatry	A - D	Nonverbal Communication
Pulmonology	E - K	Healthcare Delivery/HMO's
Rheumatology	L - R	Legal Medicine
	S - Z	Medical Ethics
Fitness & Exercise		Medical Technology
Exercise	**Resources**	
Nutrition	Glossaries	**The General Study of Medicine**
	Going to Medical School	Anatomy & Physiology
	Periodicals	Histology
	Reference & Resources	Immunology
		Microbiology

Keyword Searches that Support Standards for Life Science/Biology

Processes of Life

Search: monoclonal antibodies
Search: What are hormones
Search: mitosis in cells
Search: genetic cloning
Search: theory of evolution
Search: genetic diversity
Search: asexual reproduction
Search: DNA and RNA functions
Search: biological diversity

Publication Searching for Multimedia and Graphics for Presentations

Both students and teachers will increasingly need access to rich multimedia resources to integrate into lesson presentations and student reports. eLibrary Science provides a robust collection of these resources.

Astronomy	A.D.A.M. Animation Library
Earth Explorer	APlus Student Video
Earth Life Forms	Hutchinson's Encyclopedia
Earth Life Forms--Animals	LifeStory Publications Videos
Eye on Nature	Mathrealm Interactives
NOAA Photo Library	Science News

Publication Searching for Lesson Plan Enrichment and Student Notebooks

Publication browsing of more than 260 current science magazines and journals provides the teacher with an easy way to update their knowledge beyond the textbook and then include the ***current*** information in lesson plan activities. **Printing selected articles and making copies for student notebooks** is an easy way to keep a textbook current and enrich student learning by building a notebook of significant articles.
List of publications by subject:
http://www.proquestk12.com/pic/pdfs/eLibraryScienceContentbySubject.pdf

To browse any publication on the list above:

5. Scroll down the search page to *Advanced Search* options
6. Type the name of the publication in the *Publications* box
7. Scroll up to the *Search* box and leave it blank (no text)
8. Click the *Search* button

Sample of State Standards Search in Life Science/Biology

Teachers can use the **State Standards** search tool which is accessed at the bottom of the Search page. This tool provides articles and websites correlated directly to the state standard selected in the following search procedure:

Standards: Search by national/state standards  **Click this Link**

- After selecting the state and science subject area, teachers scroll through the standards and click on the specific standard for which they need resources.

Clicking on See Resources Automatically Searches for Correlated Resources for BookCarts

Life Science

The student will demonstrate the ability to apply facts, principles, and concepts used in the fields of plant biology, animal biology, and ecology.

reproduction, life cycle **See resources**

structure, function **See resources**

- After clicking **See resources**, teachers can review a Results List of **topics and subtopics links** that can be searched to provide relevant articles and websites.

Samples of Topic and Subtopic Links to Articles and Websites

Life Sciences (Biology) >> Microbiology >> Bacteria (Bacteriology) >> Bacteria Basics & Overviews

Life Sciences (Biology) >> Microbiology >> Protists >> Protists Basics & Overview

Life Sciences (Biology) >> Animal Sciences (Zoology) >> Animals by Familiar Name >> Insects >> Butterflies >> Introduction

Life Sciences (Biology) >> Cellular & Molecular

- Any articles and websites on the **Results List** derived from one of these subtopic searches can be automatically imported into a BookCart using **My List** and the **Add to New BookCart** tools. http://www.proquestk12.com/lsm/pqelib/pdfs/bookcartsqsg.pdf

PHYSICAL SCIENCE/CHEMISTRY STANDARDS—Students will use scientific skills and processes to explain the composition, structure, and interactions of matter in order to support the predictability of structure and energy transformations.

- Physical or Chemical Changes—Explain how the number and arrangement of electrons can be used to predict when an atom will transfer or share electrons to form a bond and explain how the resulting materials are different from the original materials (e.g., **organic, biochemical**, and inorganic examples)
- Classification of Matter—Explain that all matter has structure and the **structure serves as the basis for the properties of and the changes in matter**
- Conservation of Matter and Energy—Analyze the interrelationship of mass and energy associated with chemical, physical, and nuclear changes. (i.e. endothermic, exothermic, kinetic molecular theory, rate of change, and gas laws)

PHYSICAL SCIENCE/PHYSICS—students will use scientific skills and processes to explain the interactions of matter and energy and the energy transformations that occur.

- Mechanics—use algebra and geometry to apply the concepts of energy, force (i.e. Newton's Law, gravitation, friction), and momentum to explain the behavior of objects (i.e. linear and rotational motion, projectiles, collisions)
- Thermodynamics—analyze and **apply the concepts** of thermodynamics (i.e. laws, heat transfer, equilibrium).
- Electricity & Magnetism—analyze electric fields and their effect on charges and electric circuits (i.e., series, parallel, and complex), magnets and magnetic fields, and **explain how electricity and magnetism affect one another** (i.e., motors and generators)
- Wave Interactions—use energy transformations and physical effects to explain the interactions of waves and physical effects, (e.g., Doppler effect and Interference patterns).
- Nuclear Energy—describe **developments in modern Physics** (i.e. nuclear fission, photoelectric effect, wave-particles duality, energy of light) and their applications (e.g. nuclear power, MRI). (i.e., semi-conductors)

Topic Search = Physical Science >> Physics

Advanced Topics	**Basics**	**Introduction**
Biophysics	Acoustics & Waves	History of Physics
Geophysics	Atomic Physics	Overview
Molecular Physics	Electricity & Magnetism	What Is Physics?
Particle Physics & Quantum	Electromagnetic Energy	**Reference**
Mechanics	Mechanics	Conversion Tables
Relativity	Nuclear Physics	Data & Databases
Space & Time in Physics	Optics	Glossaries
Time & Philosophy	Other	Periodicals
Travels in Time	Thermal Physics	Physicists
		Tutorials

Topic Search = Physical Sciences >> Chemistry		
Basics & Overviews Common Chemical Compounds General Information on Chemistry Matter & Energy Periodic Tables & Elements The Atom **Biochemistry** Basics Carbohydrate (Sugar) Metabolism Enzymes Genetics Integration of Metabolism Lipid (Fat) Metabolism Other Protein Metabolism **Laboratory Methods of Analysis** General Chemistry Organic Chemistry Other Spectroscopy (Mass, NMR, & IR) X-ray Crystallography	**General Chemistry** Acids/Bases Atomic & Molecular Structure Chemical Reactions Gases Inorganic Nomenclature Introduction for Kids Resources & Reference Solutions & Mixtures Stoichiometry Types of Elements, Their Properties & Isotopes **Organic Chemistry** General Information on Organic Chemistry Nomenclature Organic Compounds Reactions Reference & Tutorials Spectroscopy	**Physical Chemistry** Electrochemistry Equilibria Gases Kinetics Quantum Mechanics Spectroscopy Thermochemistry **Reference** Calculators Chemists Constants & Conversion Factors Encyclopedias & Dictionaries Glossaries Journals & Periodicals Periodic Tables & ElementsProperties Tutorials

Keyword Searches that Support Concepts of Physical Science Standards

The Nature of Matter

Search: properties of plasma
Search: cryogenics
Search: periodic table of the elements
Search: quantum mechanics
Search: "Big Bang Theory"
Search: Fermilab accelerator

Energy and Motion

Search: chemical thermodynamics
Search: refraction of light
Search: electromagnetic spectrum
Search: black holes in the universe
Search: quark particles
Search nuclear fusion

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10. Type the name of the publication in the *Publications* box
11. Scroll up to the *Search* box and leave it blank (no text)
12. Click the *Search* button

Sample of *State Standards Search* in Physical Sciences

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- After selecting the state and science subject area, teachers scroll through the standards and click on the specific standard for which they need resources.

Clicking on See Resources Automatically Searches for Correlated Resources for BookCarts

Physics

Motion and Forces

1. Newton's laws predict the motion of most objects. As a basis for understanding this concept:

b. Students know that when forces are balanced, no acceleration occurs; thus an object continues to move at a constant speed or stays at rest (Newton's first law**).**

See resources

- After clicking **See resources**, teachers can review a Results List of **topics and subtopics links** that can be searched to provide relevant articles and websites.

Samples of Topic and Subtopic Links to Articles and Websites

Physical Sciences >> Physics >> Basics >> Mechanics >> Dynamics >> Forces >> Gravity >> Advanced Gravity Concepts

Physical Sciences >> Physics >> Basics >> Mechanics >> Statics

Physical Sciences >> Physics >> Basics >> Mechanics >> Dynamics >> Free Fall

- Any articles and websites on the **Results List** derived from one of these subtopic searches can be automatically imported into a BookCart using **My List** and the **Add to New BookCart** tools. http://www.proquestk12.com/lsm/pqelib/pdfs/bookcartsqsg.pdf

ENVIRONMENTAL SCIENCE/ECOLOGY—Students will use scientific skills and processes to explain the interactions of environmental factors (living and non-living) and **analyze their impact from a local to a global perspective.**

- Flow of Matter and Energy—Analyze how **matter and energy are conserved over time** as they move through the lithosphere, hydrosphere, atmosphere, and organisms
- Interdependence of Organisms—Use physical and chemical concepts to analyze and explain the **inter-dependence of organisms within the environment**
- Natural Resources and Human Needs—Use concepts from chemistry and physics to analyze and explain how **human activity can have positive** (recycling) and **negative** (toxic waste) **effects on the environment**

- Environmental Issues—Investigate and analyze **environmental issues** from **local to global perspectives** (e.g. world population, food production and distribution, pollution and epidemics, biodiversity)

Topic Search = Life Sciences (Biology) >> Ecology		
Animal Behavior	**Ecological Crises**	**Food Chains/Webs**
Animal Behavior Introduction	Community & Non-Profit	Components of the Food Chain
Animal Behavior Research	Environmental Organizations	Food Chain Online Activities
Animal Cognition	Deforestation	Food Chain Research
Animal Communication	Endangered Animals	General Information on the Food Chain
Animal Social Groups	Endangered Plants	Types of Food Chains
Domestic Animal Behavior	Global Cooling	
Ethograms: Plotting Animal Behavior	Global Warming	**Naturalists & Ecologists**
Predator-Prey Relationship	Help the Environment	Audubon, John James
	Kids & the Environment	Carson, Rachel
Animal Migration	Oil Spills	Cousteau, Jacques
Bird Migration	Overpopulation	Darwin, Charles
Insect Migration	Pollution	Fossey, Dian
Introduction	Snakehead Fish	Goodall, Jane
Mammal, Fish, & Other Animal Migrations	Waste Management	Muir, John
	Biogeography	**Special Topics**
Biodiversity	Biological Cycles	Community Ecology
Conservation & Biodiversity	Biomes	Environmental Design
Early Earth & Origin of Life	Ecosystems	Fire Ecology
Origin of Eukaryotes	Introduction to Biogeography	Invasive Species, Plant & Animal
Prokaryotes & Metabolic Diversity		Paleoecology
Reference	**Introduction**	Plants & the Environment
Glossaries	Biome Basics	Population Ecology
Other	Ecology Basics	Soil Science
Periodicals	Ecosystems	Visual Arts & the Environment

Keyword Searches that Support Standards for Environmental Science/Ecology

How Living Things Interact with Environment

Search: Galapagos Islands
Search: bioluminescence
Search: hydroponics agriculture
Search: ocean plankton
Search: global warming
Search: geothermal energy
Search: dangers of pesticides
Search: biosphere
Search: solar energy
Search: solid waste management
Search: fossil fue
Search: "natural selection" in an environment
Search: causes of genetic mutation
Search: transgenics

Publication Searching for Multimedia and Graphics for Presentations

Both students and teachers will increasingly need access to rich multimedia resources to integrate into lesson presentations and student reports. eLibrary Science provides a robust collection of these resources.

Earth Explorer	Mathrealm Interactives
Earth Life Forms--Animals	LifeStory Publications Videos
NOAA Photo Library	Science News
Eye on Nature	APlus Student Video
Astronomy	A.D.A.M. Animation Library
Earth Life Forms	Hutchinson's Encyclopedia

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16. Click the *Search* button

Sample of *State Standards Search* in Environmental Science/Ecology

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Life Science

The student will demonstrate the ability to apply facts, principles, and concepts used in the fields of plant biology, animal biology, and ecology.

ecology See resources

- After clicking **See resources**, teachers can review a Results List of **topics and subtopics links** that can be searched to provide relevant articles and websites.

Samples of Topic and Subtopic Links to Articles and Websites

Life Sciences (Biology) >> Ecology >> Biogeography >> Biological Cycles >> General Information

Life Sciences (Biology) >> Ecology >> Biogeography >> Biomes >> Biome Basics

Life Sciences (Biology) >> Ecology >> Biogeography >> Biological Cycles >> Carbon Cycle

Life Sciences (Biology) >> Ecology >> Biodiversity >> Conservation & Biodiversity >> Introduction

- Any articles and websites on the **Results List** derived from one of these subtopic searches can be automatically imported into a BookCart using **My List** and the **Add to New BookCart** tools. http://www.proquestk12.com/lsm/pqelib/pdfs/bookcartsqsg.pdf

TECHNOLOGY STANDARDS—Students will understand the relationship of science and technology both historically and currently including the costs and the benefits

- Understand different uses of technology in science and how they **affect our standard of living.**
- Understand the **relationship between science and technology** and develops the abilities of **technological design and application**.
- Know that there are predictable and **unpredictable consequences** of technology.

Keyword Searches that Support Standards for Science & Technology

Science, Technology, and Society

Search: organ transplant banks
Search: human genome project
Search: nuclear fusion
Search: electric automobiles
Search: ergonomic engineering
Search: nanotechnology
Search: "Three Gorges Dam"
Search: earthquakes prevention

World Famous Scientists and Inventors

Search: Jacques Cousteau
Search: "Buckminster Fuller"
Search: "Charles Babbage"
Search: "Enrico Fermi"
Search: Copernicus
Search: "Francis Crick"
Search: Tsung-dao Lee
Search: Satyendra Bose
Search: Vladimir Zworykin
Search: Hideki Yukawa
Search: "Alfred Nobel"

Search Page Feature on Famous Scientists	
FAMOUS SCIENTISTS	Browse a list of famous scientists and view accounts of their lives. 

Topic Search = Technology	
Technology	Manufacturing
Agriculture	Medical Technology
Biotechnology	Microscopy
Computers	Mining
Energy	Other Technologies
Engineering	Resources
Ergonomics	Space
Governmental Policy on Technology & Science	The Future
Introduction	Timber/Lumber
Inventors & Inventions	Transportation

APPENDIX

Use ProQuest Mini-Research Strategies to Turn Information into Knowledge Using Critical Thinking

Researched information *only becomes knowledge* when it is used to make comparisons, to predict consequences, to evaluate effectiveness, to form connections, and is then communicated to an audience with a purpose.

Elementary School or Beginners (Who, What, When, Where?)

Expand Knowledge--Reports should be mostly factual, require one good source (usually an encyclopedia article), and be delivered in a **summarized** (extracting the most important information) or a **paraphrased** (synthesizing and restating the most important information) report of less than 100 words. Students should be encouraged to attach an appropriate picture or map to the report.

Middle School or Some Experience Researching (Who, What, When, Where, How and Why?)

Students should be required to use 2 or 3 sources. Reports can be written, oral, or created by teams. Reports should be between 100 and 200 words. Encyclopedic information is appropriate as one source only if it supports the 2 strategies listed below:

- **Compare/Contrast, or Which Is Better?)**—Students research two similar leaders, authors, artists, countries, works, ideas, etc. and show how they are both alike and/or how they are different.

  Examples: Low fat or low carbohydrate diets; more government regulation or greater competition; The Bible and the Koran; classical or contemporary music; Abraham Lincoln and Franklin Delano Roosevelt; the Greeks and the Romans.

- **Critique**—Students research a popular idea, custom, tradition, modus operandi, belief, or trend, and provide a logical argument for revising, eliminating, or expanding it.

  Examples: Eating eggs and red meat is bad for your heart; no pain, no gain in fitness training; the growing deficit will into bankruptcy; to succeed, all students should go to college; affirmative action laws lead to lowering of standards, over time.

High School or Experienced (Who, What, When, Where, How, and Why/Why Not, What If?)

Students should be required to use 3 or 4 sources. Reports can be written (200 to 300 words), oral (3 to 5 minutes) or in teams. With appropriate technology and training, a PowerPoint presentation should also be encouraged. Reports should require a summary document attached as a bibliographic reference to provide authentication. Strategies for mini-research should include predicting, evaluating, and persuading.

- **Persuade**—Students research a controversial issue, select a position (or teachers could assign the position), and then create an argument to support their opinion.

  Examples: Students should have a right to free education through college; professional athletes are paid too much money; same gender schooling results in higher achievement for both sexes; euthanasia should be permitted under appropriate controls; some illegal drugs should be legalized; the federal government should pass and enforce new gun control legislation.

- **Predict**—Given a recent event, discovery, law, or invention, predict what will happen in the near future. Given a past event or series of events, create a scenario that may occur in the near future.

  Examples: Predict what will happen if nothing is done about global warming by the year 2009 and why; predict what impact genetic cloning will have on human health in 10 years and why; careers and jobs are changing rapidly: what jobs will be most in demand 10 years from now, and why? How will the Internet affect business, social life, or education? How will the International Space Station affect science, politics, and economics; how will the new Euro affect the economies of Europe?

- **Evaluate**—Given a recent (in the last 5 years) change in a law, political leader, rules and regulations, organizational structure, invention, or discovery, summarize and evaluate the progress that may have been made in society because of that change.

  Examples: The passing of the NAFTA treaty; the creation of the Dept. of Homeland Security; the introduction of distance learning courses by major colleges; welfare reform; doing business on the Internet; the launch and repair of the Hubble telescope.

ProQuest Mini-Research Strategies and Higher-Order Thinking Skills

Tailoring Mini-Research Strategies To Meet the Needs of Your Students

A single research topic can provide a **range of mini-research activities** that can be tailored to the **learning levels of students**. The same basket of resources retrieved from a single search can be used to answer a variety of research problems and issues. These strategies are **derived from the scientific-based research** of Benjamin Bloom and ***Bloom's Taxonomy*** that demonstrates that permanent learning only takes place when students **engage higher-order thinking skills in their school assignments**.

TOPIC: *GLOBAL WARMING*
KEY WORD SEARCH: causes of global warming
ENGAGING ISSUE: See the list below

Mini-Research Strategy	***Essential Quesitons***
Expand:	What is global warming and why is it important? (*look up and paraphrase – lowest level*)
Compare/Contrast:	How can we be sure that global warming is not just part of some natural cycle?. (*intermediate level critical thinking skills*)
Critique:	What actions by society and/or nature have contributed to global warming and why? (*intermediate level*)
Predict:	Why and how will the future be different if nothing is done to reverse global warming? (*higher-level*)
Persuade:	What laws and strategies can the U. S. Government do to help to reverse global warming? (*higher-level*)
Evaluate:	How effective have past actions been by government and/or business to reduce global warming? (*highest*)

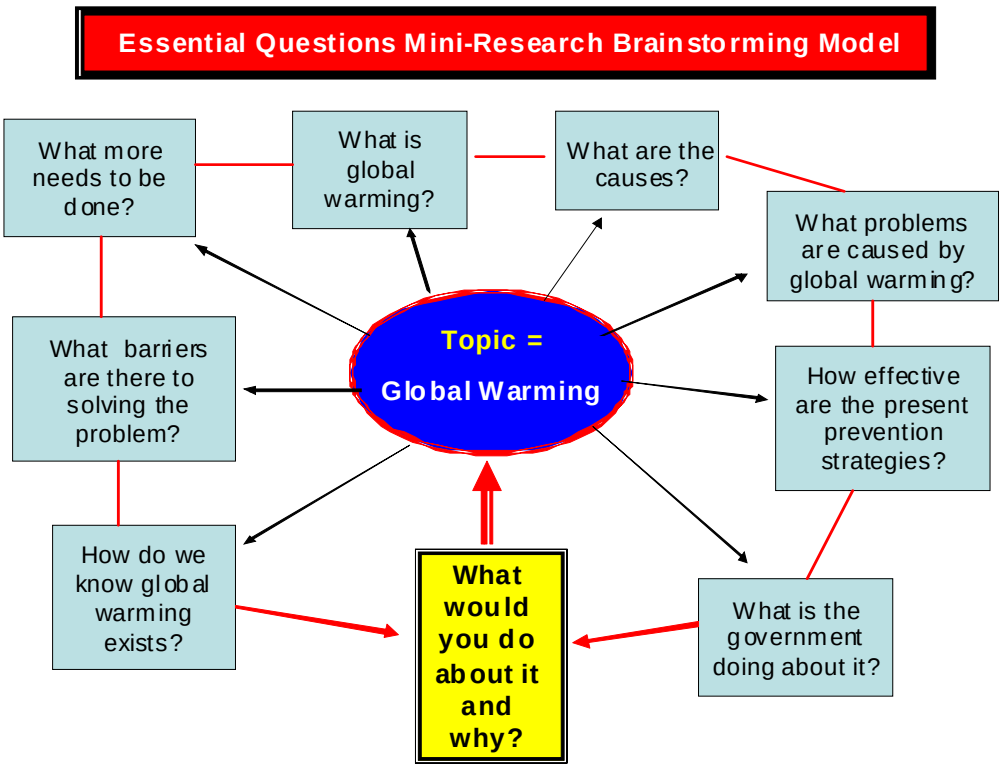
Higher-Order Thinking Level	Bloom's Taxonomy—BLOOM, B. S. (1956)
KNOWLEDGE ***Most Student Testing*** *(Lowest Level)*	• observation and recall of information • knowledge of dates, events, places • knowledge of major ideas • mastery of subject matter *Question Cues:* list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
COMPREHENSION	• understanding information • grasp meaning • translate knowledge into new context • interpret facts, compare, contrast • order, group, infer causes • predict consequences *Question Cues:* summarize, describe, interpret, contrast, predict, associate, discuss, distinguish, estimate, differentiate, extend
APPLICATION	• use information • use methods, concepts, theories in new situations • solve problems using required skills or knowledge *Questions Cues:* apply, demonstrate, calculate, complete, illustrate, solve, examine, modify, relate, classify, experiment, discover
ANALYSIS **Research Activities**	• **seeing patterns** • **organization of parts** • **recognition of hidden meanings** • identification of components *Question Cues:* **analyze**, separate, order, explain, connect, classify, arrange, divide, **compare**, select, **explain**, **infer**
SYNTHESIS **Research Activities**	• **use old ideas to create new ones** • **generalize from given facts** • **relate knowledge from several areas** • **predict, draw conclusions** *Question Cues:* **combine, integrate, modify, rearrange**, substitute, create, design, invent, **what if**?, **compose**, formulate, **generalize**
EVALUATION **Research Activities** **(Highest Level)**	• **compare and discriminate between ideas** • **assess value of theories, presentations** • **make choices based on reasoned argument** • **verify value of evidence** • **recognize subjectivity** Question Cues: **assess, decide**, rank, grade, test, measure, **judge**, **recommend,** explain, **discriminate**, **support, conclude**, **summarize**

MINI-RESEARCH -- BRAINSTORMING THE PROBLEM/ISSUE

Too many times teachers make research assignments that are so global in nature that students and librarians who assist them are confused about what to research. The assignment is "do a report on **global warming**." This usually results in the copying an encyclopedia article either by hand or by copy/paste, changing a few words, then printing and turning in the report. The result is usually plagiarism and minimal learning. The focus of the report defaults to the facts of who, what, when, and where, all of which involve lower-order thinking skills.

A brief brainstorming session prior to researching, using the mini-research process and a **graphic organizer** (www.inspiration.com) is the best way to guide students into thinking about all aspects of the problem to be solved and include questions of **how, why, why not, and what if which are higher-order thinking skills tested on state assessments.** The advantage of this process is that students do not have to think in sequence (outline form). Instead, they think randomly (brain research confirms the validity of this approach especially for novices) about the topic/problem with any one question prompting another, until 3-6 questions emerge. These **essential questions** are the basis for research and their answers will be analyzed and synthesized by the student to create original thought in the form of a report.

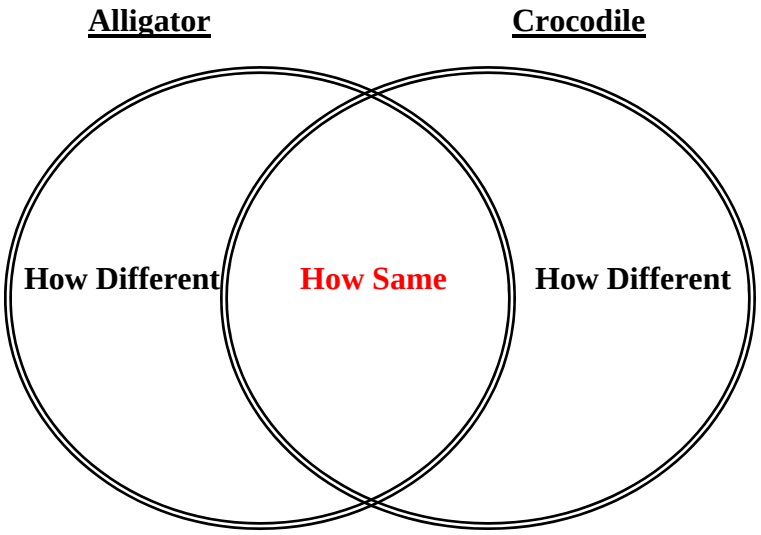
The graphic below is an example of this process. Each question brainstormed is written in one of the spaces without regard to which space and in what order. The teacher leads the process making sure that some of the questions involve how, why, etc. so that students are focused on problem solving and developing informed opinions on issues that affect their lives.



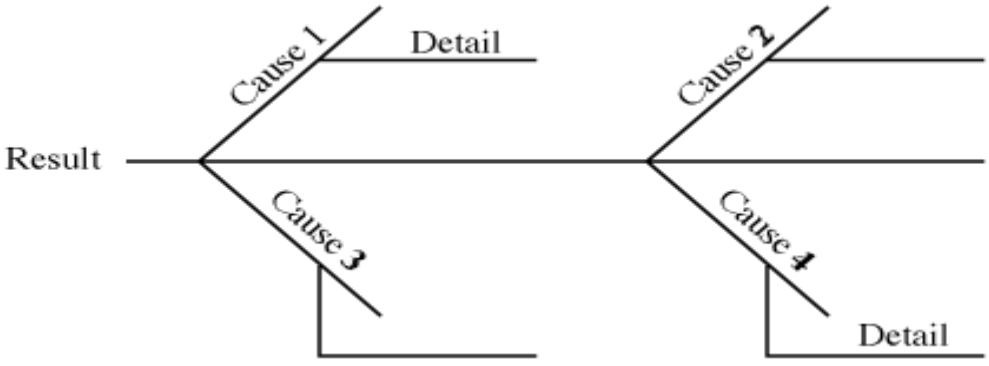
Graphic Organizers Help Student Brainstorming for Mini-Research

Graphic organizers or concept maps help student to organize their thinking and research for inquiry-based activities. Here are two samples below that teachers can adapt for their research assignments. A great source of concept mapping software to use in conjunction with research assignment can be trailed at www.inspiration.com. For a variety of other graphic organizers try www.writedesignonline.com/organizers/

Venn Diagram – Useful for visual learners to **compare and contrast** the characteristics of 2 people, places, events, or things that are similar while researching information for a report. Write descriptors in the spaces before and after researching and before reporting.



Cause and Effect Map -- Used to show the causes of a complex event (an election, the creation of a significant structure or work, a war, etc.) or complex phenomenon (juvenile delinquency, learning disabilities). Key questions: What are the factors that cause/caused X ? Are they interrelated? How can we modify or eliminate a cause(s) and alter the result? Fill in the map (**Detail**) as you gather research information for your report, or as a plan for research if you already know some of the significant causes.



ESSENTIAL QUESTIONS Model for Mini-Research Helps Prevent PLAGIARISM

SHOULD STEM CELL RESEARCH WITH HUMAN EMBRYOS BE STOPPED?

Executive Summary—by Tammy Weisman

Stem cell research with human embryos has the potential to develop breakthrough cures for a host of genetic diseases that kill millions of Americans and other people in foreign countries. Stem cells are basic cells that develop first in human embryos after fertilization. All other specialized cells in the human body evolve from stem cells by a process that is not fully understood today. By understanding this process, scientists could grow new organs and other specialized cells to replace damaged or diseased cells in human beings, and thereby prolong and extend the quality of their life?

Why would this research not be acceptable and even be supported by everyone? Those who oppose this research argue that it is immoral to use human embryos because in the research process you are destroying a potential human being. Others who support the research argue that by not engaging in research, we are allowing the destruction of existing human beings.

I support the right to do research on existing embryos and if necessary, to have new sources of voluntary donations to increase the supply. If research in our country is stopped, then it will continue in some other country that may not have the best interests of our citizens in mind.

History has shown that when major scientific discoveries have occurred, they are always challenged by religious groups who predict all sorts of dire consequences for humanity. History has also shown, that when these discoveries are adopted and managed well, human beings have always benefited. Many examples of this are second nature to us now: blood transfusions, organ transplantation, vaccination, etc.

Information that Addresses Essential Question 1: What is stem cell research and why is this issue important?

Source: Stem-cell research: Drawing the line; Anonymous; The Lancet 07-21-2001; Page: 163

Embryonic stem cells are pluripotent, meaning they are capable of developing into any cell type in the human body. Animal research suggests stem cells may some day provide a way to repair or replace diseased tissues and organs and make it possible to treat people with a wide variety of conditions, such as diabetes, Parkinson's disease, and Alzheimer's disease, for which we currently have no cure. Embryonic stem cells are harvested from three sources: aborted fetuses, so-called cadaveric stem cells; embryos left over from in-vitro fertilisation efforts, so-called discarded embryos; and embryos created in the laboratory solely for the purpose of producing stem cells, so-called research embryos.

Information that Addresses Essential Question 2: Who Opposes this research and why?

Source: Stem-cell research: Drawing the line; Anonymous; The Lancet 07-21-2001; Page: 163

Opposition to the use of embryonic stem cells from any of these sources comes mainly from those who hold that human life begins at conception and that destroying an embryo at any stage of development is tantamount to infanticide.

Some stem cells, however, have also been isolated from adult tissues, and opponents of human embryonic stem-cell research argue that research should be limited to such cells. But the general view of scientists working in this area is that adult stem cells, while they may one day prove useful for treatment, are simply not as versatile as their embryonic counterparts, because they are already partly differentiated.

Source: Defending cloning and stem cell research against faith-based curbs; Hull, Richard T; Flynn, Tom; Free Inquiry 01-01-2002; Page: 27

The report expressed the concern of conservatives that "society (and not only the embryos) will suffer irreversible moral harm by crossing the boundary that allows nascent human life routinely to be treated as a natural resource." This view turns on seeing embryos at their earliest stages as identical with humans that will, if those embryos are allowed to develop, clearly exist. This key belief, as well as the tactics of some of its proponents, deserves careful investigation. For, if it cannot stand up to nontheistic philosophical analysis, basing governmental policy on it crosses the boundary separating church and state.

Information that Addresses Essential Question 3: Who supports this research and why?

Source: Stem-cell research: Drawing the line; Anonymous; The Lancet 07-21-2001; Page: 163

Advocates of embryonic stem-cell research hold that while embryos certainly deserve respect they are not yet fully human and that the good that may result from medical research studies with their cells justifies use.

Source: Defending cloning and stem cell research against faith-based curbs; Hull, Richard T; Flynn, Tom; Free Inquiry 01-01-2002; Page: 27

For, if it cannot stand up to nontheistic philosophical analysis, basing governmental policy on it crosses the boundary separating church and state.

In 1997, the Council issued "A Declaration in Defense of Cloning and the Integrity of Scientific Research." Thirty-one leaders in biology, philosophy, ethics, and other fields signed this document, which the defended the inherent moral licitness of biotechnologies including human cloning.

Source: Several G.O.P. Senators Back Money for Stem Cell Research; Pear, Robert; The New York Times; 06-19-2001; Page: A.18

Two of the senators, Orrin G. Hatch of Utah and Susan Collins of Maine, said such experiments could be conducted safely and ethically under guidelines adopted by the National Institutes of Health. Senator Hatch, a foe of abortion, told Mr. Bush that research with embryonic stem cells The president's advisers on science and health policy, including Tommy G. Thompson, the secretary of health and human services, see immense potential value in research with embryonic stem cells. But Karl Rove and other political advisers worry that support for such research would alienate conservative voters, anti-abortion groups and the hierarchy of the Roman Catholic Church.

Source: Ethicist weighs in on stem cell research; Jim Buckell; The Australian; 04-09-2003; EDITION: 1

Dr Young said stem cell research was progressing rapidly and if opportunities to extend stem cell lines available for research did not expand in the US, companies such as Genron would consider shifting overseas. Already it was developing proposals to shift work to Canada, Korea, China or Singapore, where restrictions were not so great.

Source: Cancer, Up Close and Personal; Golden, Carl; The New York Times; 03-30-2003; Page: 14

I, and others like me, understand the position of those who oppose stem cell research on the ground that it represents destruction of human life. To us, it represents saving lives. We are not eager to engage in an abstract argument, probably never to be settled, over when life actually begins; many of us are painfully aware of when life actually ends.

Evaluating Mini-Research Reports

Mini-research reports **are not term papers**. They need to be relatively easy to evaluate. For this reason, this model will focus mostly on the research process (and the inherent *higher-order thinking skills--HOTS*), not solely on the traditional criteria of correctness of the ideas, or the mechanics and format of the content. Critical thinking elements are shown in **(*red bolded italicized text*).** Teachers can create their own system by varying the *Worth* factor or by including additional criteria or excluding existing criteria. Use the model below as a guide, but keep it simple!

Recommended Evaluative Criteria and Critical Thinking Skills	**Worth**	**Score**
1. The essential questions for research were clear, relevant, and purposeful as they related to the hypothesis/issue/problem. (***brainstorming***) NOT APPLICABLE if 3 Essential Questions model is used.	10	8
2. The search process yielded information relevant to the 3 essential questions and the summary was approved and signed by the teacher prior to the final report. (***searching***)	10	10
3. The **Draft Summary *** of the researched information provided a variety of viewpoints and was relevant and sufficient to answer the essential questions. (***analyzing***)	20	15
4. The report included recommended citation formats for 3-4 sources summarized in the integrated Draft Summary. (***organizing***)	5	5
5. The report used recommended format models correctly (***organizing***)	10	10
6 The report demonstrated a high level of use of correct language arts mechanics (***language arts skills***)	10	8
7. The report flowed from an attention-grabbing introduction to development of important details, to a conclusion based on the Draft Summary (***synthesizing***)	30	25
8. The report is both meaningful and interesting to other readers. (***creativity***)	5	5
** Draft Summary is the organized collection of the essential information with citations of the 3-4 sources selected from eLibrary Science searches or BookCarts that help to answer the 3 essential questions and are included with the final report/project*		
Totals	**100**	**86**

A more traditional model is available for teachers. This model is characterized by:

1. Similar to the mini-research 3 Essential Questions model—restricted to 3-4 resources and 150-200 words
2. Start by brainstorming 4 or more essential questions
3. Draft Summary is approved and signed by teacher prior to writing of the report
4. In-text references in the body of the written report that reference the separate but attached draft summary

http://www.proquestk12.com/pic/pdfs/ELib_Edu_Guide.pdf (eLibrary Guide)

eLibrary, Mini-Research and Student Achievement

Scientific research on "what works in the classroom" has identified many learning activities that help to increase student achievement. One of those activities is student research on engaging current issues. Through technology and the Internet, it is possible for this type of successful traditional learning activity to occur **more frequently** than in the past through "mini-research," therefore its benefits are multiplied. These benefits include the essential skills of **critical reading, expository** and **persuasive writing,** and **higher-order thinking**. These skills are the heart of state standards and the accompanying state assessments that measure student achievement. ProQuest mini-research guides provide the strategies, models, and research topic ideas to motivate and prepare teachers to integrate more of these activities into their classrooms.

Because of the breadth of media content and ease of use features of eLibrary, valuable time saved in the **lesser skill of searching** for relevant information, can now be invested in the **essential skills** mentioned above. Remote access provides opportunities for parental support and homework that extends these proven learning activities begun in the classroom.

Scientific Research Support for Student Research Activities Students Learn Better When They	**Teacher + Textbook Learning**	**Teacher + Textbook+ eLibrary Science**
Have daily access to visual and multimedia content as well as verbal information (*most learners have a visual learning styles*)	No	**Yes**
Are involved in solving problems relevant to their community and world (*permanent learning only occurs when information is socially relevant*)	?	**Yes**
Have daily access to current information in the topic of study (*learning in context of the learner's world increases permanent memory*)	No	**Yes**
Have to defend their opinions on relevant issues with facts (*information can be constructed into permanent knowledge through engaging inquiry-based activities*)	?	**Yes**
Integrate reading with writing in an activity that focuses on questions of how, why, why not, and what if. *(higher-order thinking results in greater learning*)	?	**Yes**
Integrate reading and writing in the same activity (*both reading and writing are learned more effectively when taught together rather than separately*)	?	**Yes**
Demonstrating the results of their work and ideas to peers or others (*peer review provides the motivation that is essential to learning,*)	?	**Yes**
Collaborate with others to solve a problem or defend an opinion (*collaboration and communication provides essential feedback to test learner ideas and concepts*)	?	**Yes**
Investigate topics in depth (*in depth learning provides greater retention of ideas; surface learning of facts is temporary*)	?	**Yes**
Learn by doing (*application of facts and concepts through activity results in increased learning*)	?	**Yes**
Can easily explore other topics related to the current lesson or theme (*the brain processes information through patterns and associations*)	No	**Yes**
Can learn anytime and anywhere (*learning is more efficient when students are ready to learn*)	No	**Yes**
Integrate time-saving technology tools into their learning process (*time on task is vital for greater retention of information*)	No	**Yes**
Access learning resources at home and at school (*parental involvement and meaningful homework are essential in successful learning*)	No	**Yes**