



Idea Bank

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The Encyclopedia of Earth

High school teachers and their students require reliable, accessible, and understandable information about nature's ecosystems and how people interact with them. This is particularly true as we face issues such as climate change, pollution, habitat degradation, and myriad other global and local challenges. Understanding these complex environmental issues requires some basic knowledge of ecology and specific details about the different issues of concern. But where can teachers and students find reliable and useful information on these topics?

Google search results

The development of the internet has opened up new avenues of access to information. In fact, so much information is available that it has become problematic: Internet searches often provide an overwhelming number of links to seemingly relevant sources. For example, Google searches for

terms associated with common environmental issues often return millions of entries (Figure 1), but only some of these results are reliable and useful to readers.

No one who wants information about climate change, for example, is going to read all of the 22 million articles produced by a Google search. A simple solution may be to start with the first result listed. Petrilli (2008) found that a Wikipedia article was the first result listed in 87 out of 100 searches and that one of these articles was among the first three results listed 100% of the time. Similarly, when searching environmental terms, a Wikipedia article was listed first 70% of the time and was among the first two articles 100% of the time.

Many teachers caution students about relying on information found on Wikipedia—an online encyclopedia (or wiki) that is written and edited collaboratively by anonymous volunteers from around the world. Wikipedia itself suggests that people “should

not use only Wikipedia for primary research” (2009). The popularity of Wikipedia indicates that it can be a useful tool for many purposes, but it may not be the best source for accurate information about the environment.

A reliable resource

For reliable information on the environment written and reviewed by experts, students and teachers can instead turn to the Encyclopedia of Earth (EoE; see “On the web”). Based at Boston University (BU) and operated in partnership with the National Council for Science and the Environment (NCSE), the EoE is a free, fully searchable collection of articles written by scholars, professionals, educators, and experts who review each other's work using the same collaborative electronic platform as Wikipedia. However—unlike Wikipedia—all EoE articles are written by recognized field experts and are reviewed and approved by qualified topic editors. The EoE is also transparent: All contributors use their real names and all work is tracked and recorded. Authors' and topic editors' biographies are available on the site so that readers can see who is producing the information.

The scope of EoE is broadly defined, with particular emphasis on the interaction between society and natural ecosystems. The EoE covers more than 130 topics ranging from agriculture, to resource economics, to zoology. The articles are written in nontechnical language and are intended to be useful to students, educators, scholars, policy makers, professionals, and the general public. The EoE published its first articles in October 2006 and has since grown to include more than 5,000 entries.

FIGURE 1 Rank of Wikipedia articles in Google results.

This table shows the number of articles returned in a Google search (i.e., hits) for ecological and environmental topics and the rank of the Wikipedia article (i.e., order listed) on that topic. This search was conducted on December 3, 2009.

Topic	Number of Google hits	Rank of Wikipedia article
Climate change	22,300,000	2
Global warming	10,500,000	1
Pesticides	3,280,000	1
Air pollution	11,900,000	1
Extinction	59,700,000	1
Invasive species	1,640,000	2
Biome	298,000	1
Habitat destruction	967,000	1
Ozone hole	590,000	2

Using the EoE

The EoE can be useful to teachers and their students in a variety of ways. The search function makes it easy to find articles related to a particular topic of interest, and all articles contain links to related articles. In addition to individual articles, the EoE also includes special collections on topics ranging from the geography and environments of Africa, to the writings and influence of well-known ecologist Aldo Leopold, to the environmental and social issues in the field of economics. The Ecology Collection, for example, provides the basic information about ecology that students need to place environmental issues in the appropriate context.

The EoE also makes environmental classics available online, including books such as Charles Darwin's *On the Origin of Species* (1859) and Henry Thoreau's *Walden* (1854) and articles such as Garrett Hardin's "The Tragedy of the Commons" (1968). The EoE recently published an online environmental science textbook intended for use in Advanced Placement (AP) Environmental Science classes.

High school science teachers may find the EoE helpful when searching for background information to prepare a course section on a particular topic (e.g., biodiversity). They can also refer their students to the EoE as a reliable source for research—and a good alternative to Wikipedia. With so much information available on the internet, it is important to identify particular electronic resources that you trust and can send students to without hesitation. For information on the environment, the EoE is a valuable online resource.

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On the web

Encyclopedia of Earth: www.eoearth.org

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Climate Change Inquiries

Pack up the polar gear, class, and don't forget your gloves—we're taking a field trip to Antarctica to collect historic climate data!

If only this scenario could be true! In reality, Antarctic experiments take

years to plan and millions of dollars to execute. This leaves teachers with a conundrum: How can students engage in authentic inquiry on global climate change if they are not able to do the actual experiments? Many questions about climate change emerge over large areas and long periods of time. The good news is that much of the data from these experiments is available for free online. Students can use this data to answer their inquiry questions and compare their results to those of the scientific community.

Online data collection

The Center for Remote Sensing of Ice Sheets (CRE SIS) studies the response of polar ice sheets to climate changes, which may ultimately result in global sea-level rise. The education team at CRE SIS works to connect teachers with actual climate-change data and has developed the K–12 Data Portal—an online collection of data for classroom use (see "On the web"). This portal offers a welcome alternative to the multitude of other online data, which require extensive teacher processing to be suitable for the classroom. The K–12 Data Portal contains a range of data—from atmospheric carbon dioxide to global surface temperature anomalies—that can be used for a variety of classroom investigations.

Inquiry-based science

You may be asking yourself whether using existing data is truly inquiry-based science—since students are not designing and performing their own experiments. The use of available data can most certainly be inquiry-based—but the accompanying lesson must be