



HAPPY NEW YEAR – 2008

It is a year for anniversaries and celebrations!!!

Pittsburgh will celebrate 250 years
NASA will honor an anniversary of 50 years
Rachel Carson – ending recognition of the 100th Anniversary of her birth
Herb Society of America celebrates 75 years
Western PA Conservancy – ending 75 years
Western PA Unit of the HSA celebrates the 50th anniversary
PRCST – looking ahead to 25 years of service
International Geophysical Year 50th anniversary observance
International Heliophysical Year – 2007-09

By the Chinese Calendar

2008 is the Year of the Rat,
which is also known by its former name of Wu Zi

AND ----2008 is a Leap Year

February 29, 2008

Year 2008 is a leap year, with 29 days in February. February 2008 has five Fridays - it starts and ends on a Friday. Between 1904 and 2096, leap years with same day of week for each date repeat every 28 years which means that the last time February had 5 Fridays was in 1980 and next time will be in 2036.

From <http://www.timeanddate.com/date/leapyear.html>

What is a leap year?

A leap year is a year with one extra day inserted into February, the leap year is 366 days with 29 days in February as opposed to the normal 28 days. (There are a few past exceptions to this).

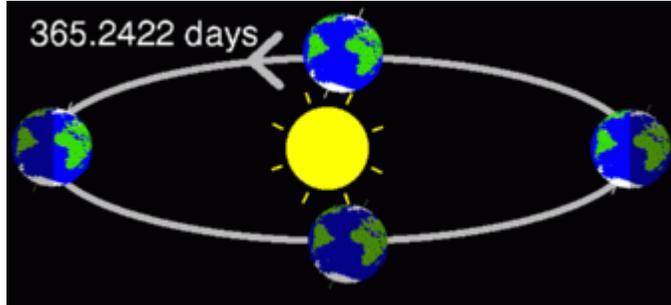
Why are leap years needed?

Leap years are needed so that the calendar is in alignment with the earth's motion around the sun.

Details

The vernal equinox is time when the sun is directly above the Earth's equator, apparently moving from the southern to the northern hemisphere.

The mean time between two successive vernal equinoxes is called a tropical year, and it is about 365.2422 days long.



Note: The illustration does not have the right dimensions for the earth, sun and orbit path.

Using a calendar with 365 days would result in an error of 0.2422

days or almost 6 hours per year. After 100 years, this calendar would be more than 24 days ahead of the seasons (tropical year), which is not a desirable situation. It is desirable to align the calendar with the seasons, and make the difference as small as possible.

By adding leap years approximately every 4th year, this difference between the calendar and the seasons can be reduced significantly, and the calendar will follow the seasons much more closely than without leap years.

(One day is here used in the sense of "mean solar day", which is the mean time between two transits of the sun across the meridian of the observer.)

From: <http://ideas4writers.wordpress.com/2007/08/15/forthcoming-historic-anniversaries-feb-2008/>

200 years ago (11 Feb 1808)

Anthracite was first burned as a fuel

199 years ago (12 Feb.) Darwin is born

75 years ago (10 Feb 1933)

The first singing telegram, introduced by the Postal Telegram Company, New York

50 years ago (1 Feb 1958)

The United Arab Republic was founded

20 years ago "A Private Universe" – award winning video of Harvard graduates describing their ideas about the seasons

*“The problems we have created in the world today will not be solved
by the same level of thinking that created them.”
Albert Einstein*

ENVIRONMENT and HEALTH

A Systems Approach

ENVIRONMENT AND HEALTH: A SYSTEMS APPROACH

The successful program for the new initiative conducted by PRCST moved ahead during fall of 2007 with six more schools participating. A series of professional development workshops brought together teacher teams as they identified nexus point in their existing curriculum where meaningful connections across disciplines can be made.

Program Overview

This program assists educators in developing, assessing and revising teaching units suitable to their classes that enable them to teach about health and the environment as a system; this enables the students to better understand concepts, issues and their interrelationships. The approach is naturally embedded in more than one discipline; knowledge from one domain is connected to knowledge in other domains.

Using the environment as an integrating focus across the curriculum provides multiple perspectives and provides a deeper understanding of the connections that exist. The interactions between the environment and our health are legion, and face us daily in the news and environmental reports. With a specific focus theme, the relevance of connecting ideas becomes clearer, students become more engaged and are empowered for future learning.

- 1) During the pilot program with Cohort One, the areas of 1) Obesity Crisis, and 2) Air Quality – fine particulates (especially mercury) were a focus. During Cohort Two the areas of Water Quality and Climate Change were added.

These issues are primary concerns today both nationally and globally. They provide the relevance necessary for student engagement and learning.

1. Environmental Literacy

The goal of environmental education is to develop an environmentally literate citizenry, empowering students with knowledge, skills, and attitudes that help them understand and gain insights into the Earth's systems and our interactions with these systems.

2. Systems

Systems thinking can help direct attention toward connections and the networks that are formed

“System is an idea that helps us think about parts and wholes. It draws attention to the interactions of the parts of something with one another and the relation of the parts to the whole. The idea emphasizes effects – what influences the behavior of something and what, in turn, that thing accomplished.” AAAS

PRCST thanks those who supported the Pilot Program:

*Carnegie Mellon University
Center for Environmental Oncology
PDE Office for Environment/Ecology
University of Pittsburgh*

Thanks to all those who provided resources, speakers, and programs for the program:

*Air & Waste Management Association – A&WMA
Center for Environmental Oncology - CEO
DEP – Education Grants program - workshops
Graduate School of Public Health
McGowan Center for Regenerative Medicine
NETL – National Energy Technology Laboratory
PDE Office for Environment/Ecology – Kits and Related Materials
Pittsburgh Tissue Engineering Initiative - PTEI*

See Synergy files for specific workshop and program information.

A moment's insight is sometimes worth a life's experience.

Oliver Wendell Holmes (1809-1804)

SCIENCE / ENVIRONMENTAL NEWS

Black History Month: Ralph Elwood Brock was an entrepreneur from Pottsville, Schuylkill County, PA who owned a private nursery. (1882-1958). His environmental accomplishment: Graduate Forester of the PA State Forest Academy's first class of 1906; later, became the nursery superintendent of the Mount Alto State Forest Nursery.

From: DEPEarthwise 2000 envirocard series. A packet of these cards will be available to participants in the "Environment and Health: A Systems Approach" Program

From Above The Fold Newsletter Online:

Floating rubbish dump in Pacific Ocean 'bigger than US' [Sydney Daily Telegraph](#), Australia.

IT has been described as the world's largest rubbish dump, or the Pacific plastic soup, and it is starting to alarm scientists. It is a vast area of floating plastic debris. It is a vast area of plastic debris and other flotsam drifting in the northern Pacific Ocean, held there by swirling ocean currents.

Discovered in 1997 by American sailor Charles Moore, what is also called the great Pacific garbage patch is now alarming some with its ever-growing size and possible impact on human health. The "patch" is in fact two huge, linked areas of circulating rubbish, says Dr Marcus Eriksen, research director of the US-based Algalita Marine Research Foundation, founded by Moore.

Although the boundaries change, it stretches from about 500 nautical miles off the coast of California, across the northern Pacific to near the coast of Japan. The islands of Hawaii are placed almost in the middle, so piles of plastic regularly wash up on some beaches there. "The original idea that people had was that it was an island of plastic garbage that you could almost walk on. It is not quite like that. It is almost like a plastic soup," Dr Eriksen says. "It is endless for an area that is maybe twice the size as continental United States," he says. The concentration of floating plastic debris just beneath the ocean's surface is the product of underwater currents, which conspire to bring together all the junk that accumulates in the Pacific Ocean.

Moore, an oceanographer who has made the study of the patch his full-time occupation, believes there is about 100 million tones of plastic circulating in the northern Pacific - or about 2.5 per cent of all plastic items made since 1950.

About 20 per cent of the junk is thought to come from marine craft, while the rest originates from countries around the Pacific like Mexico and China.

Australia plays its part too, he says.

<http://www.news.com.au/couriermail/story/0,23739,23157068-952,00.html>

All about: recycling. Today, the global recycling industry generates \$160 billion a year, processing more than 500 million tons of materials. What's not to like about recycling? [CNN](#)

<http://edition.cnn.com/2008/WORLD/asiapcf/02/03/eco.about.recycling/>

As a concept, recycling has lived and died many times throughout its 4,000-year old history. But it always re-emerges as an idea when humans need it most, such as during the Great Depression, and later during World War II, when American companies recycled or reused around 25 percent of the waste stream.

Today, the global recycling industry generates \$160 billion a year, processing more than 500 million tons of materials. The industry is becoming one of the world's biggest employers. While the official amount of people employed by the industry is 1.5 million worldwide, the real figure -- when you factor in illegal recycling operations in the developing world -- is likely to be much, much higher. The United Nations believes, for example, that as many as 10 million people in China alone are now in the recycling business.

What's not to like about recycling?

There are some fairly persuasive arguments for recycling, and for using recycled goods. Energy savings is just one of them. By reusing existing materials you are essentially removing the process involved in sourcing the "virgin materials" in the first place.

Take soda cans, made from aluminum. According to Friends of the Earth, creating a ton of these from scratch takes five times the amount of energy as it would to produce a ton of recycled cans. According to the Bureau of International Recycling (BIR), the companies that manufacture recycled aluminum are using 95 percent less energy than if they were using "virgin materials." (For plastics the energy savings are almost as high -- 80 percent, BIR says, while making paper from recycled paper (as opposed to wood) can save 64 percent of energy.)

Looking at it another way, according to the National Recycling Coalition, the amount of energy saved in one year by Americans recycling their soda cans, plastic containers, newspapers and packaging represented the energy equivalent of:

- Enough gasoline to power 11 million passenger cars for a year
- A year's worth of electricity supply for 17.8 million Americans
- 11 percent of the energy produced by coal-fired power plants in a year
- 29 percent of nuclear electricity generation in a year

What to do with old electronics?

All the latest gadgets means a growing amount of “throw-away” electronics, most ending up in the trash: TVs, iPods, and even fluorescent light bulbs. Some box stores are beginning to offer recycling plans or take-back programs. Some states are tightening their waste laws. Computers, TVs and other electronics contain materials such as lead, cadmium, and mercury, that can pose risks to human health and the environment. Some products labeled “eco-friendly” still contain hazardous materials – even though they are labeled to save energy. Ex. The mercury in LCD TV screens and the lead in computer monitors may contaminate soil or water if not handled properly. There is no federal law for the disposal of consumer electronics! A handful of states, however, have made it illegal to throw electronics in the trash.

Inadvertent contamination. A preliminary investigation of wastewater sludge and dust samples from U.S. and New Zealand research bases in Antarctica reveals unexpectedly high concentrations of flame retardants, at levels comparable with those in U.S. urban centers. [Chemical & Engineering News](http://pubs.acs.org/cen/news/86/i05/8605notw1.html)
<http://pubs.acs.org/cen/news/86/i05/8605notw1.html>

Southern Drought: Drought in the southeast may force nuclear reactors to throttle back or even temporarily shut down because the rivers are drying up and cannot supply power plants with the huge amounts of cooling water needed to operate. Any shut down would result in blackouts, and certainly higher electric bills for millions of customers – since the nation’s utilities could be forced to purchase expensive replacement power from other energy components. An Associated Press analysis of the nation’s 104 nuclear reactors found that 24 are in area experiencing the most severe drought.

End of the Holocene? Human impact on Earth’s surface has become so expansive that scientists say we have entered a new epoch! Based on a proposal of a Nobel prize-winning chemist, a team from the University of Leicester and colleagues on the Stratigraphy Commission of the Geological Society of London, factored in transformed patterns of sediment, disruptions to the carbon cycle, and wholesale changes to the world’s plants and animals. They agreed that human dominance had so changed the Earth’s planetary landscape that the post-industrialized Earth can no longer be considered still in the Holocene epoch.

DATABASE

Protecting the Allegheny River – Western PA Conservancy

In our 40-year history with the river, WPC has protected 22 river islands totaling more than 500 acres. Several of these islands are now part of the Allegheny River Islands Wilderness, a component of Allegheny National Forest. The Conservancy has also protected 19,500 acres of shoreline, floodplain, valley slope and tributary watersheds. In addition, WPC has protected 10,800 acres of land near the river, supporting our conservation goals for the watershed. WPC’s conservation work on the Clarion River

(11,600 acres protected), a major Allegheny tributary, will also help to insure the quality of the larger river into the future. See the website www.waterlandlife.org to read this issue of "Conserve".

From the Annenberg Media Update - online

This February 12 marks the 199th birthday of Charles Darwin, the English naturalist and major proponent of evolutionary theory. Mark the occasion with our resources related to Darwin and evolution.

> **Harvard Professor Andy Knoll discusses Darwin's theory and a long, long history of animal life on earth in this interview** <<http://www.learner.org/redirect/february/hab56.html>> on the Web site for "The Habitable Planet: A Systems Approach to Environmental Science."

> **"Rediscovering Biology: Molecular to Global Perspectives"** <<http://www.learner.org/redirect/february/rbio57.html>> covers evolution in Units 3 and 9. Also read these expert interviews on the human genome project <<http://www.learner.org/redirect/february/rbio58.html>> and evolution <<http://www.learner.org/redirect/february/rbio59.html>>. Click on "Case Studies" to find out about the evolution of túngara frog mating calls.

> **K-6 teachers can benefit from "Essential Science for Teachers: Life Science"** <<http://www.learner.org/redirect/february/life60.html>> Session 5, "Variation, Adaptation, and Natural Selection," and Session 6, "Evolution and the Tree of Life." Session 5 includes a photo and brief biography of Darwin.

> **Extremophile microbes prompt scientists to peer back into the ancient past, to discover what they believe may have been the first life forms on Earth. Explore the topic with "Unseen Life on Earth: An Introduction to Microbiology"** <<http://www.learner.org/redirect/february/unsee61.html>> Program 6, "Microbial Evolution."

> **Watch "Earth Revealed"** <<http://www.learner.org/redirect/february/earth62.html>> Program 10, "Geologic Time," and Program 11, "Evolution Through Time." Program 11 discusses changes in Earth's species over time, plus the development of "punctuated equilibrium," a concept added to Darwin's theory to account for the lack of intermediate forms between species in the fossil record.

Find a photograph of Darwin

<<http://www.learner.org/redirect/february/apass63.html>> and one of the Scopes Monkey Trial <<http://www.learner.org/redirect/february/apass64.html>> on the American

Passages Web site. Professor Abby Werlock's remarks about the role of Darwin's "survival of the fittest" notion in the development of literary realism <<http://www.learner.org/redirect/february/apass65.html>> may also be of interest.

More Links:

> "The Habitable Planet: A Systems Approach to Environmental Science" <<http://www.learner.org/redirect/february/hab51.html>> looks at weather in Unit 2, "Atmosphere," and covers climate change in Unit 12, "Earth's changing climate."

> **Our Weather interactive**
<<http://www.learner.org/redirect/february/weath52.html>> discusses many aspects of weather, including forecasting. Try out the Storm Chaser activity and visit Related Resources for a good list of links related to weather.

NSTA "The Science Teacher" Sept. 2007

The theme of this issue is "weather and climate" with articles ranging from investigating environmental effects to activities based on the web to the infusion of climate determinants . You may browse NSTA journal articles by issue. Many articles are free; others are available for \$4.99 or less to download. See www.NSTA.org

Teach about Climate Change – From Edutopia article "Truth and Consequences: Teaching Global Warming Doesn't Have to Spell Fear" at www.edutopia.org/global-warming-fear

More than 100 life, physical science resources - New resources with lesson plans. Register to access at www.teachersdomain.org/collections/wgbh/lsp07/all_resources.html

DIRECTIONS

National Science Digital Library – NSDL – a new blog "Beyond Penguins and Polar Bears" - a cyberzine. Features cross-curricular content and lesson plans, footage of polar wildlife, exchanging between classrooms. Two grade bands: K-2 and 3-5. visit <http://expertvoices.nsd.org/polar>

NASA Student Challenges for Spring – “Searching for Water on the Moon” and “Develop and justify a research question related to revealing images of Antarctica”. See <http://quest.nasa.gov/challenges/lima>

PRCST Workshops:
April 5 NASA GLOBE Phenology Workshop, Moraine State Park
8:30am-3:30pm ; Six Act 48 hours
This workshop will serve as a preparation for Earth Day programs as we explore seasonal changes from Spring – Fall.
June 13 STS by Green Design Workshop – Environment and Health Initiative
Regional Learning Alliance
8:30am-3:30pm ; Six Act 48 Hours
This workshop will explore the interactions of our environment and health – working across disciplines. A highlight will be onsite work using the new DEP Energy Trailer. Space limited so register early. Many resources available.
June 18 NASA GLOBE Soils Workshop, Regional Learning Alliance
8:30am-3:30pm ; Six Act 48 Hours
This workshop places the emphasis on the basis of our existence –soils – and the impact on our water, agriculture, and air quality.
Contact PRCST for registration at the above workshops.
Phone: 412/648-7315 Fax: 412/648-7081
konrad@pitt.edu
Leave Your Name, School, Phone, Address, email for registration

NSDL WHITEBOARD REPORT #130 February 6, 2008

Whiteboard Report news is on the Web at <http://NSDL.org> and <http://expertvoices.nsd.org/whiteboardtalkback>. Back issues are available at <http://content.nsd.org/wbr/Issue--Archive.php>.

Teaching the Feb. 20 Lunar Eclipse

<http://expertvoices.nsd.org/highlights>

A total lunar eclipse will be visible in North America on February 20th beginning at 8:43 pm Eastern and 5:43 pm Pacific time. This prime-time celestial show should be an excellent teaching opportunity for young astronomers, and several good web resources are available. NASA's "Official Eclipse Home Page" is the most extensive, with downloadable diagrams for each time zone, a full discussion of conditions and special circumstances for this event, and a good set

of links. The Search for Extra-Terrestrial Intelligence (SETI) Institute's site has a good one-page Frequent Questions sheet. And Sky and Telescope magazine has a guide to all four visible eclipses that will happen in 2008, including a total solar eclipse on August 1 that will run in a narrow swath from the Canadian Arctic to Mongolia. If that isn't your ideal vacation, just wait -- the next total solar eclipse visible in North America is scheduled for August 21, 2017.

New BEN Resources

<http://expertvoices.nsd.org/pathwaysnews>

The number of peer-reviewed educational resources in NSDL's Biological Sciences Pathway (BEN) portal recently expanded by more than 20 percent. Among the 1,500 new items are lessons, laboratory exercises, journals, multimedia, and online interactive pages like the Video and Image Data Access (VIDA) collection for Science and Inquiry during Teacher Preparation. These are 199 annotated science video and images with content and language appropriate for K-8 science. A VIDA resource called Main Zones of the Intertidal Zone shows an area of the Central California coast where the tides rise and fall daily, alternatively submerging and exposing the shore to ocean water. The images discuss the important characteristics of each zone, and a link to the NSDL Strand Map system allows users to relate the resource to national educational standards and benchmarks. Descriptions of the new BEN resources will be posted each week on the NSDL Pathways News blog.

Teachers Domain Polar Resources

<http://www.teachersdomain.org/exhibits/ipy07-ex/index.html>

The new Polar Sciences Collection from Teachers' Domain was funded by NSF as an education activity of the International Polar Year. Twenty new resources have been added, along with links to supplemental resources that are already on Teachers Domain. Nearly all the new resources are available in the site's Open Educational Resources section for public download and reuse. "We hope that these materials will help bring polar sciences into classrooms across the country and help to focus attention on the importance of the work taking place during International Polar Year," says Ted Sicker, PI of Teachers' Domain, an NSDL Pathways project. "We plan to expand the special collection later this year with the 40 new resources we'll be developing as part of another NSF-funded project called Engaging Alaska Natives in the Geosciences."

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SUN EARTH DAY – Theme: Space Weather Around the World – 2008

See: <http://sunearthday.nasa.gov>

Solar week will fall during the week of March 17th. See: <http://solarweek.org>

International Geophysical Year 50th Anniversary Observance

The International Geophysical Year (1957-58) was conceived as an attempt to coordinate globe-wide measurements of the Earth, the oceans, the atmosphere, and the Sun. Such a large undertaking required and successfully achieved international cooperation in a time of increasing geopolitical tension. The extraordinary accomplishments of the IGY are legion:

- The discovery of the Van Allen belts that ring the earth.
- The launching of the first artificial satellite (Sputnik).
- The charting of ocean depths and ocean currents.
- A detailed study of the Earth's magnetic field that soon led to the revolutionary plate tectonics theory.
- Measurements of upper atmospheric winds

- The first concerted study of the Antarctic continent and ice sheets.

- Finally, the Antarctic Treaty, that made the continent a place of scientific research, free of national claims and inter-national strife. See: <http://www.geosc.psu.edu/~sak/IGY/>

National Environmental Education Week April 13-19

Many programs and resources. See: www.eeweek.org

CALENDAR

Feb. 20-22, 2008

New Learning Technologies Orlando Conference 2008
Orlando, FL

<http://www.1105newsletters.com/t.do?id=858198:1020117>

Feb 22-23, 2008

Keystone Coldwater Conference
Penn Stater Conference Center Hotel, State College, PA
Contact: Coldwater Heritage Partnership

412/359-5233 or visit www.coldwaterheritage.org/coldwaterconference.htm

Feb. 26-29, 2008

2008 Annual NCCE Educational Technology Conference
Seattle, WA

<http://www.1105newsletters.com/t.do?id=858200:1020117>

Feb. 29-March 2, 2008

20th Annual T3 International Conference
Dallas, TX

<http://www.1105newsletters.com/t.do?id=858202:1020117>

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June 18 NASA GLOBE Soils Workshop, Regional Learning Alliance
8:30am-3:30pm ; Six Act 48 Hours

Contact PRCST for registration at the above workshops.

Phone: 412/648-7315 Fax: 412/648-7081

konrad@pitt.edu

Leave Your Name, School, Phone, Address, email for registration

International Heliophysical Year – see: <http://www.ihy2007.org/> February 12 - 13, 2008
International Year of Planet Earth - Global Launch Event Paris, FRANCE
[Event Details](#)

February 20 - 22, 2008

ISU's 12th Annual Symposium "Space Solutions to Earth's Global Challenges"

Strasbourg, FRANCE

[Meeting Details](#)

Abstract Deadline: 5 October 2007

March 20, 2008 ●

Sun-Earth Day 2008 Worldwide

[Event Details](#)

IHY Contact: [Elaine LEWIS](#)

March 20 - April 16, 2008 ●

WHI: Whole Heliosphere Interval

Worldwide

[Event Details](#)

IHY Contact: [Sarah GIBSON](#)

April 8 - 12, 2008 ●

Exploring the Solar System and the Universe

Bucharest, ROMANIA

[Meeting Details](#)

IHY Contact: [Cristina DUMITRACHE](#)

NSTA National Conferences

Boston, MA: March 27–30, 2008

New Orleans, LA: March 19–22, 2009

NSTA 2008 Area Conferences

Southern—Charlotte, NC: October 30–November 1

Western—Portland, OR: November 20–22

Midwestern—Cincinnati, OH: December 4–6

June 16 - 20, 2008 ●

Meeting on the Heliosphere and its Environment

Warsaw, POLAND

[Meeting Details](#)

IHY Contact: [Wieslaw MACEK](#)

October 4 - 10, 2008

World Space Week

Location: Worldwide

[World Space Week Home Page](#)