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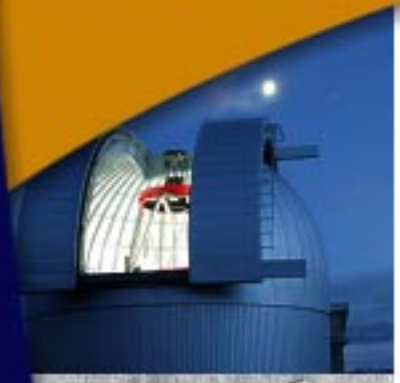
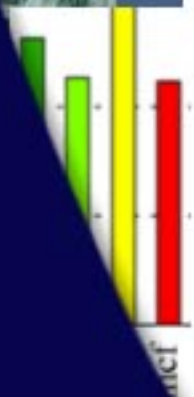
learners online

November 2009





ISSN#1536-9315

Multi-touch for Elementary Education

J. Alan Baumgarten

Microsoft released the retail version of its long-awaited Windows 7 operating system on October 22, promising computer users a faster and more stable environment as well as features and usability improvements that will appeal to enterprise users.

From an educational computing perspective, what interests me most about Windows 7 is its support for multi-touch, which I believe has the potential to pave the way for innovative educational software development. I am simultaneously surprised that no educational technology leaders seem to be interested in it.

Anyone who has used an iPhone implicitly understands the value and potential of touch interfaces. Untethered from a clumsy mouse and keyboard, the touch interface allows users to directly manipulate screen objects with touch, natural finger gestures, and movement of the device.

A popular multi-touch application that my children enjoy on the iPhone is a game called Pocket God. In it, the user literally plays god to a small village of island natives. Stroking the sky controls the weather. Dragging the sun and moon changes the time of day. Tapping a coconut makes it fall from the tree to feed the villagers. The point is that even the youngest of children—even those without fine motor skills—can interact with this virtual world in natural, intuitive, simple ways.

If instructional designers were to apply the same level of thought and creativity into multi-touch interfaces aimed at elementary education, we could finally begin to realize the true potential of educational computing for young learners. Most objections to computers in the elementary classroom center around the unsuitability of the computer keyboard and mouse for little hands. Critics argue that learning should be active an hands-on, that children should be working with their hands and bodies, manipulating objects, sculpting, singing, and dancing. I actually agree, and that is exactly why I am so excited by the potential of multi-touch, which promises to deliver authentic and naturalistic learning experiences for young children once we make it available to them.

With Windows 7, Flash Player (which already supports multi-touch), and the next OS release from Apple, the software infrastructure is in place. Inexpensive multi-touch monitors will be available by next year, and multi-touch smartboards will follow. We just need more educational software developers to step up and take notice.

A Rock Solid Exploration

Lisa Kerscher

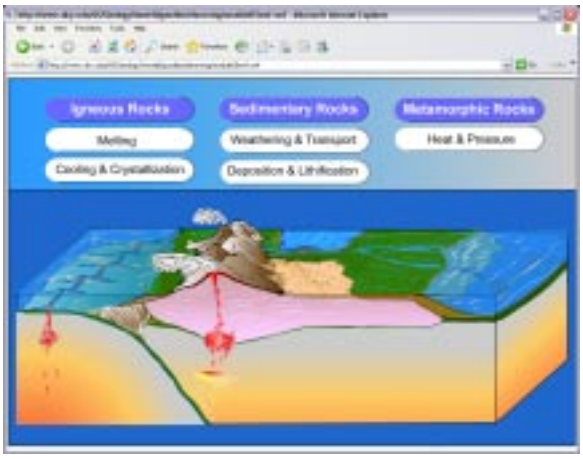
NS9-12.4 Earth and Space Science
- Geochemical Cycles

TEKS
§112.49. Geology, Meteorology, and Oceanography.
(7) Science concepts. The student knows the origin and composition of minerals and rocks and the significance of the rock cycle. The student is expected to:
(C) classify rocks according to how they are formed during a rock cycle; and
(D) examine and describe conditions such as depth of formation, rate of cooling, and mineral composition that are factors in the formation of rock types.

From gravel roads to gemstone jewelry, people use and desire all types of rocks. Although no two rocks are exactly the same, each offers clues into where and how it was formed.

Rocks seem to earn little respect from the average human. Precious gemstones, like diamonds, certainly get some select attention and reverence, but what about the rest? Perhaps this attitude stems from their commonplace existence. Humans everywhere rely on rocks to build homes, make roads more stable and safe, and to incorporate into a variety of useful consumer and industrial products. Even in these common uses, however, not every rock type is suitable for every job. How each has been formed, as well as its composition, is a major factor in what it looks like, where it is found, and how it can be used.

Brainstorm with students some ways that different types of rocks are used in their homes and neighborhoods. Write down the list on a classroom board. Generate another list of memorable rock formations that they have seen while hiking, driving, or reading through magazines, newspapers or Web sites.



Now, ask students to describe some of the processes by which rocks are formed. List their ideas. Prompt students to match a process with each item on the first two lists. Keep these lists and potential matches posted throughout the rock cycle exploration.

The Rock Cycle

Understanding how different types of rock form is fundamental to any geology instruction. Before getting started, group students into small, cooperative teams. Invite teams to begin their Rock Cycle exploration at the University of Kentucky's Department of

Earth and Environmental Sciences. The module is divided into the major rock types–sedimentary, igneous, and metamorphic. Click into each process listed below each rock type to learn about how the rock type is formed. Encourage students to take notes as they review.

Teams should then explore the Rock Cycle interactive provided by Annenberg Media. This module starts out with brief text explanations of the three major Types of Rocks and gives a brief overview of key characteristics for identification. Ask students to print this page or copy the characteristic categories by hand. The module also offers an interactive identification exercise. As a team, students complete the rock collecting and analysis. They will have six minutes to correctly identify each rock's characteristics and pick the class in which the rock belongs. For each incorrect answer, the module displays the correct answer. Each team should replay the exercise, until they answer every question correctly in a single round. Following this exercise, the module goes more in-depth into the processes of How Rocks Change and provides an excellent Rock Cycle Diagram.

After students have completed their initial rock cycle exploration, ask each team to construct diagrams and flowcharts to illustrate their understanding of how each rock type is formed. They should also include specific, named examples for each type, such as limestone, gneiss, and basalt. Allow students to revisit the rock cycle Web sites if further review is needed. Once they have completed their set of illustrations, ask teams to share them with each other to help identify where some teams may need to correct or add information to ensure accuracy and completeness.

Using their illustrations as support tools, tell them to Test Your Skills. Complete the quiz as a team or individually. Students can print and turn in their results. Encourage students to add more information to their illustrations, as needed, and then complete the quiz again until they have answered all questions correctly.

Post the teams' illustrations in a shared place, so that all team members can access and refer to them throughout this topic's exploration online and offline.

What's That Rock?

The Open University, located in the United Kingdom, offers an exceptional interactive rock analyzer in its British Isles Geology Toolkit. This tool will further hone student skills in rock identification. In their teams, read the introduction and then enter the analysis lab. The virtual locker holds samples from which students choose to examine. The analyzer prompts students to answer questions through the process. It also offers a magnifying lens to examine each sample more closely.

Ask students to analyze no fewer than five samples and as many as 24. For each sample, they should record their sequence of decisions. Analyzing samples in the virtual locker is good practice, because the module knows when the conclusion is incorrect. When this is the case, the module suggests that the student re-analyze the sample. When students re-analyze, they should record that round of answers. Referring to their previous analysis should provide clues as to where they took a wrong turn. When all teams have completed their set of sample identification, lead a group discussion. Ask each team to share one example of where they took a wrong turn and why they think that happened. What are some of the challenges in identifying rock types?

Following the group discussion, assign each team to develop a formal identification tree. The guide should include named examples from the virtual locker. Teams should then compare their guides, so they can help each other ensure accuracy.

Now, teams are ready for a little field work. Ask each student to bring in three to five samples they find in the local area or ones that they have collected from other areas. At least one sample should be local. If they bring in a sample from another area, the student must know the location from which it was collected (this may include where a gift shop is located). Either individually or as a team, use the identification guides to analyze each field sample. Students should create an identification card for each sample, which includes:

- the rock type's name
- a short sentence describing where it was collected

- a diagram of the rock cycle process that formed it
- a brief explanation of how the sample may have ended up in that location (this may require tracing a likely transportation route and further research into the original location's geologic history)
- the collector's name

As a class, invite students to set up their field sample exhibits grouped by rock type. Display the exhibit in the classroom or in a more public display area. As a related extension, samples collected in the local area can be used to explain the region's geologic history. Posters with supporting text and illustrations can be added to flesh out the exhibit's story.

Reference:

University of Kentucky – Rock Cycle
http://www.uky.edu/AS/Geology/howell/goodies/elearning/module05swf.swf

Annenberg Media – Rock Cycle
http://www.learner.org/interactives/rockcycle/index.html

British Isles Geology Toolkit
http://www.open2.net/sciencetechnologynature/worldaroundus/geologytoolkit/whatrock_embedded.html

More than Just Patterns: Tessellations

Stephanie Tannenbaum

Tessellations have amazed and enthralled observers of all ages and backgrounds over centuries and across many cultures. The system of tilings and transformations based on geometric principles and patterns is a mathematical wonder that never ceases to amaze young children and adults alike.

A tessellation is a system of repeating patterns constructed of regular geometric shapes that interlock together across a plane. The pattern is consistent and uniform throughout and there are no gaps and shapes do not overlap. The word tessellation derives from the Latin term, tessella which is a small tile in a mosaic and from the Greek term, tesseres which means four. Countries all over the globe exhibit examples of historic tessellated artwork on the walls of their buildings, on their landmarks, in their parks, and even on their streets. Students will find the visual exploration an exciting lesson in geometry.

Students explore a number of geometric concepts through a set of visually stimulating and hands-on Web activities.

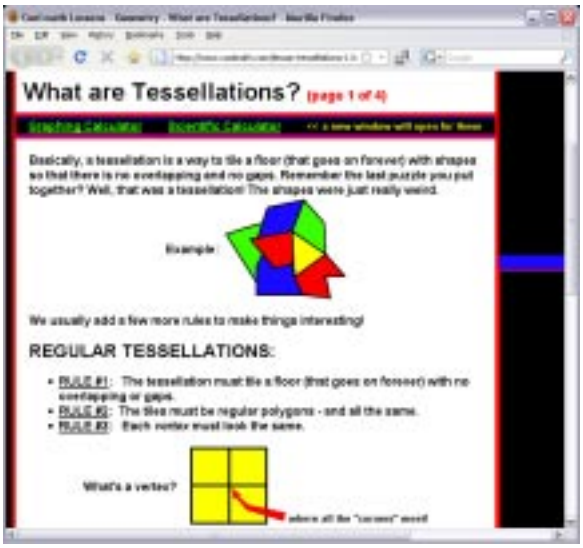
NM-GEO.6-8.1
Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;

NM-GEO.6-8.3
Apply transformations and use symmetry to analyze mathematical situations
describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling;

TEKS
§111.34. Geometry
(5) Geometric patterns. The student uses a variety of representations to describe geometric relationships and solve problems.
(C) use properties of transformations and their compositions to make connections between mathematics and the real world, such as tessellations

What Is a Tessellation?

Start by introducing the concept of tessellations by sending students to What are Tessellations? By CoolMath. Students should work through each of the four lesson pages. Ask students to write down the three rules for a regular tessellation and draw two examples in a math journal or on a sheet of paper.



Continue with another introduction to the basics that discusses tiling, Introduction to

Tilings from Science U. Pair students up to work through this set of lessons together. Point out the various hot links embedded within the page and remind students to click and review all of them. After finishing this set of lessons, point them to Tessellations from misterteacher.com. This easy-to-follow set of mini lessons discusses transformations through interactive demonstrations and examples. Ask students to write a description of tilings and transformations in their math journals or on a sheet of paper and draw one example for each.

A Gallery of Tessellations

After students have a basic groundwork for tessellations, visit What are Tessellations? by Tessellations.org. Start with the Tessellations menu. After reading The Beginnings, take a break from this site and send students to A Virtual Walking Tour: Alhambra. Students may take the tour individually, in pairs, or as a whole class. Return to the Tessellations site and continue with Symmetry. Next, use the Gallery menu to point students to look through the following galleries: Seth Gallery 3, David Gallery 1, and Escher Gallery 1. Students may look at other galleries if time permits.

Continue looking at historical examples of tessellations by visiting Tilings from Historical Sources by Steve Edwards of Southern Polytechnic State University. Invite students to peruse examples from each of the twelve cultures listed in blue links near the top of the page. Working alone, students should print out one image of their favorite historical example and conduct Web research about this location and turn in a two-paragraph historical description along with the image.

Continue exploring samples of tessellations at the Totally Tessellated site. This exploration of tessellations from Oracle Education Association ThinkQuest displays a variety of unique tessellations. If students are interested in learning more about how tessellations came to be so popular, point out the History link. Otherwise, click Essentials to read about the structure of a tessellated polygon or object. The Mosaics/Tilings gallery provides many more examples. Assign students to work with a partner to click through and watch the animations for at least one type of tessellation in each of the four categories.

Master of Tessellations

Probably the most famous mathematician and artist to rely on tessellations is M.C. Escher. He used geometric transformations to create fascinating pieces of art. Read the Biography of M.C. Escher (click Biography in the left-hand bar). This is the official site about the enigmatic artist sponsored and maintained by the M.C. Escher Foundation. Next, click M.C. Escher at Work to watch four video interviews with the artist of geometry. Finally, point out the Picture Gallery and encourage students to look closely at his brilliant work. Continue learning about M.C. Escher by returning to the Tessellations.org Web site. Open the "Tessellations" drop-down menu and click "M. C. Escher." Read each page and click each of the interactive demonstrations. Open the "Galleries" drop-down menu and click "Escher Galleries." Ask students to answer the following questions:

- Where in the pictures can you find examples of tessellations?
- Where do you see tilings?
- Where do you see other geometric transformations?
- Can you think of examples of tessellations that occur naturally in real life?
- Make a list of all of the vocabulary terms that could describe the relationship of shapes in a tessellated pattern.
- Make Your Own Tessellations

Now it is time to invite students to learn how to make their own tessellation. Visit Shodor Interactivate's Tessellate! activity. Start with the Learner tab and review the information. This is an ideal whole-class wrap-up lesson. Then point students to the Activity tab where they find an opportunity to create a number of their own tessellations digitally. Remind students to review the tips in the Help tab. Next, return to the Tessellations.org site. Under the Do It Yourself menu, select Basic Facts. Continue by reading through the first three examples under the Do It Yourself menu including Line Method, Slice Method, and Gap Method.

Upon finishing this exploration of tessellations, ask students to look for patterns that occur naturally that tile, transform, and/or tessellate. After making some tessellations, students will appreciate the mathematical foundations of these visually stimulating samples of art. Tessellations may be an ancient artistic and architectural tradition, but they are just as fascinating today.

Reference:

Cool math – What are Tessellations?
http://www.coolmath.com/lesson-tessellations-1.htm

Science U – Introduction to Tilings
http://www.scienceu.com/geometry/articles/tiling/index.html

Tessellations.org – Tessellations
http://www.tessellations.org/tess-what.htm

Saudi Aramco – A Virtual Walking Tour: Alhambra
http://www.saudiaramcoworld.com/issue/200604/alhambra/default.htm

Steve Edwards of Southern Polytechnic State University – Tilings from Historical Sources
http://www2.spsu.edu/math/tile/grammar/index.htm

Oracle Education Associates ThinkQuest – Totally Tessellated
http://library.thinkquest.org/16661/

Shodor – Interactivate: Tessellate!
http://www.shodor.org/interactivate/activities/Tessellate/?version=1.6.0_15&browser=MSIE&vendor=Sun_Microsystems_Inc.&flash=9.0.28

Thanksgiving Poems

Rachel Cummings

During Thanksgiving we celebrate the events and people we most appreciate. Why not mark the occasion with an ode?

Eons ago, Greek poets celebrated occasions with odes. A chorus performed these formal, lyric poems during public events along with song and dance. Greek odes (called Horatian Odes) employed a formal structure with a repetitive rhyme and meter, drew connections to lofty ideas, and used apostrophe (direct address of an inanimate object or absent person, often using 'thou.')

Odes have changed through the ages. Less prominent today than during ancient Greece, contemporary odes appear without song or dance. Likewise, the structure is less formal. However, three hallmarks of the ode remain the same: they celebrate something or someone, they make connections to lofty ideas or themes, and they address an individual or object (apostrophe).

Thanksgiving-time provides an opportunity to read an ode or two, and to write an ode to something you hold dear. The Internet provides examples, inspiration, and guidance.

Ode Exploration

Begin by asking students to record two things or people they appreciate and then three specific characteristics about each item. A three column chart might prove helpful. Set these thoughts aside and introduce the definition of an ode and its three enduring characteristics. Review the poetic devices often found in odes—simile, metaphor, apostrophe, and personification. Poetry as We See it reviews seven poetic techniques, including simile, metaphor, and

NL-ENG.K-12.6
APPLYING KNOWLEDGE
Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and nonprint texts

TEKS
§110.20. English Language Arts and Reading, Grade 8
(15) Writing/Literary Texts. Students write literary texts to express their ideas and feelings about real or imagined people, events, and ideas.
(B) write a poem using:
(i) poetic techniques (e.g., rhyme scheme, meter);
(ii) figurative language (e.g., personification, idioms, hyperbole)

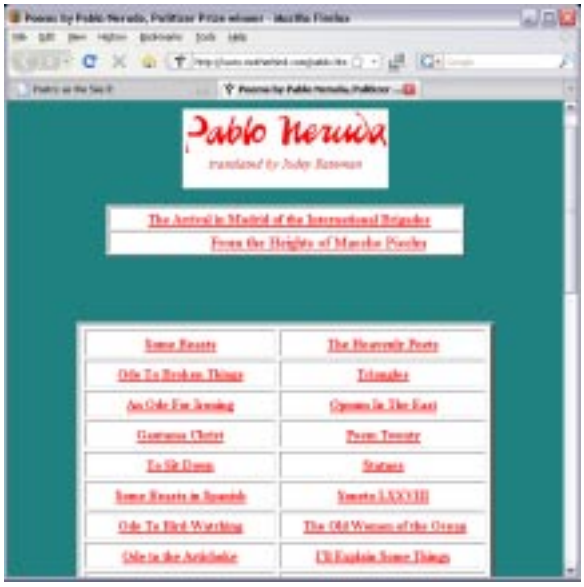
personification. Click a device in the left margin for definitions and student examples. At the bottom of each page are additional links for classic poems, and a practice exercise. Alternatively, try a PowerPoint presentation that reviews Figurative Language.

Delve into the workings of an ode; point students to Gary Soto's poem, *Ode to Pablo's Tennis Shoes*. As they read, ask them to annotate and record their questions on Response Sheet 1. Guide students to discuss the form, mood, and figurative language of the poem:

- What does the poem celebrate?
- How does the poem make you feel and how does the author accomplish this?
- What figurative techniques are used? Identify some. How do they support the form and mood of the poem?

Ask students to re-read *Ode to Pablo's Tennis Shoes*, this time with an eye to how the author subtly reveals things about Pablo. What do tennis shoes reveal about Pablo? Direct them to write what they learn on this graphic organizer.

To read more, contemporary odes, turn to Pablo Neruda. Neruda wrote several odes that celebrate everyday objects. For bilingual students, *Ode to My Socks* is available in its native Spanish and English.



Mature students may be interested in reading (or writing) a more structured, traditional Horatian ode. The ehow *video, How to Write an Ode,* explores the standard format and rhyme scheme of *Ode to a Grecian Urn*. Schoollink.org shares a lesson plan, including questions, for Keats' classic *To Autumn*. The lesson plan, which is intended for teachers rather than students, includes the poem, questions (Activities and Follow-up) and Notes: What is an Ode? This site provides a complete package for probing a more complicated Ode.

Ode Inspiration

Soto and Neruda wrote about the beauty and their appreciation for commonplace objects. To emphasize the beauty

of banal objects, as well as their connection to universal themes and big ideas, show students the flying plastic bag scene from the movie *American Beauty*. If time permits, introduce students to an ode of a different genre: Beethoven's Ode to Joy accompanied by nature inspired slideshow.

Return students' attention to the three-column chart where they previously recorded what they most appreciate. Instruct them to add an object in the final column. Ask them to brainstorm as many details for each object or person as possible in five minutes. Finally, using a think-pair-share format, allow students to share their three ideas with a partner. Each partner should offer feedback: which idea is most interesting? Which idea has the most developed details? What ideas or thoughts might the partner offer before a rough draft is written? Finally, release students to free write a rough draft of an ode. If students would like to challenge themselves, they may want to try the traditional rhyme scheme employed by Horatian odes.

To celebrate this Thanksgiving season, introduce your students to the most celebratory of poems: the ode. All that is necessary is some figurative language, a connection to the larger world, and most importantly, a deep appreciation for something—a plastic bag, string, and even just a pair of tennis shoes.

Reference:

Ehow – How to Write an Ode
http://www.ehow.com/video_4987152_write-ode.html

Figurative Language PowerPoint
http://infusion.allconet.org/webquest/PowerPoints/FigurativeLanguage.ppt#256,1,Slide1

Pablo Neruda Odes
http://www.motherbird.com/pablo.htm
http://www.forks.wednet.edu/FHSMAIN/LangArts/sanchez/Ode%20to%20My%20Socks.htm

Poetry as We See it
http://library.thinkquest.org/J0112392/

Scholastic – Ode to Pablo's Shoes
http://teacher.scholastic.com/lessonplans/unit_poetryslam_ode_reproducible.pdf
http://teacher.scholastic.com/lessonplans/unit_poetryslam_ode_responsesheet.pdf
http://teacher.scholastic.com/lessonplans/unit_poetryslam_ode.pdf

Schoollink – To Autumn
http://www.schoollink.org/csd/pages/engl/ode.html

Teacher Vision – Three Column Chart
http://www.teachervision.fen.com/tv/resources/PDF/GOOD_TV_3_6_pdf_s/62177_InRCd_85.pdf

YouTube
http://www.youtube.com/watch?v=YAOTCtW9v0M&feature=related
http://www.youtube.com/watch?v=xu8_8TJC9E8

Seven Wonders of the Ancient World

Andrea Annas

Quick, can you name all seven ancient wonders of the world? It is harder than it sounds. Few people can correctly name them all.

Scholars credit Callimachus of Cyrene who lived approximately from 305-240 BC with making the first list of world wonders. His list no longer exists, but many believe it influenced succeeding lists like the one written by Philo of Byzantine around 250 BC. Philo of Byzantine's list includes the traditional seven ancient world wonders: the statue of Zeus at Olympia, the Colossus of Rhodes, the temple of Artemis in Ephesus, the Mausoleum at Halicarnassus, the lighthouse of Alexandria, the pyramids of Giza, and the hanging gardens of Babylon. Only one of these wonders, the pyramids of Giza, still stands. Yet, during the time of Alexander the Great, when wealthy Greeks traveled to see these wonders or theamata (things to be seen), they stood as magnificent testimonies to the grand societies that created them.

Students take an exhilarating journey back in time as Greek tourists and tour the seven ancient wonders of the world.

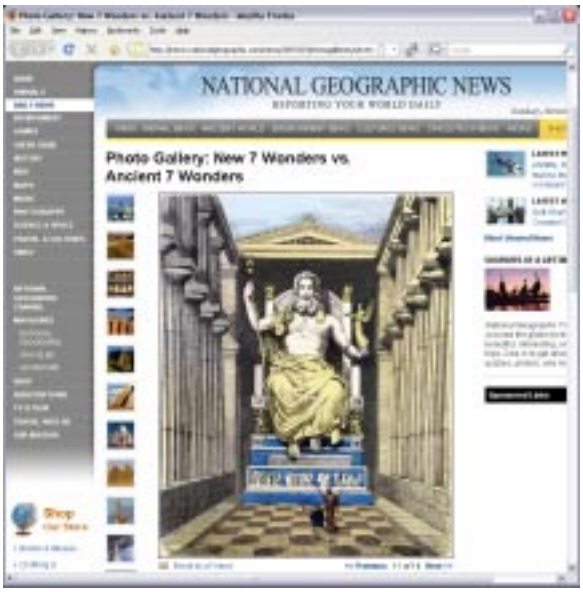
NSS-WH.5-12.3
ERA 3: CLASSICAL TRADITIONS, MAJOR RELIGIONS, AND GIANT EMPIRES, 1000 BCE-300 BCE
The emergence of Aegean civilization and how interrelations developed among peoples of the eastern Mediterranean and Southwest Asia, 600-200 BCE.

TEKS
§113.33. World History Studies
(1) History. The student understands traditional historical points of reference in world history. The student is expected to:
(A) identify the major eras in world history and describe their defining characteristics;

The Traditional Seven Wonders

First, since we are imagining ourselves as Greek tourists, visit the BBC site Ancient Greeks and become familiar with life in ancient Greece. Explore the Greek world, learn about growing up in Greece, visit the Greek Olympics, and much more. Once you are well versed in life as a Greek, find the locations of the seven wonders of the ancient world on the interactive History Channel map at the site Seven Wonders of the World.

Then, begin the tour at the Greek city of Olympia. Located at the site of the Olympic Games, inside the temple of Zeus is the first wonder, the statue of Zeus. Sculpted by Phidas in the mid fifth century BC, ivory and gold covered this forty-foot statue. For nearly eight hundred years, the statue of Zeus remained in Olympia until the Roman emperor closed the temple and had the statue moved to Constantinople. It was here in Constantinople that an earthquake later destroyed the statue of Zeus. You will be amazed by this first wonder by viewing an artistic image of the Statue of Zeus hosted by National Geographic.



Another spectacular sculpture on the list of sites to see is the Colossus of Rhodes located along the Mediterranean Sea on the island Rhodes. This giant bronze statue of the Greek god Helios stood at over one hundred feet tall and took over twelve years to construct. Completed around 280 BC, the Colossus of Rhodes looked over the harbor for only sixty years before it collapsed due to an earthquake. Rhodesians never rebuilt the statue and centuries later invading Arabs sold the statue's remains as scrap metal. Historians have found no record of the actual appearance of the Colossus of Rhodes. However, gain an idea of its monstrosity by viewing an artistic rendition of the statue hosted by National Geographic. Most artistic renditions like this one have Colossus of Rhodes straddling the harbor entrance, but most historians believe its size makes this impossible and believe the statue's creators actually built the legs close together for support.

Located to the east of Greece in Turkey are two more world wonders: the temple of Artemis in Ephesus and the Mausoleum at Halicarnassus. The queen of Caria, Artemisia, commissioned the Mausoleum of Halicarnassus for her husband, Mausolus. Workers completed the massive, white marble mausoleum around 350 BC about three years after the death of Mausolus and one year after the death of Artemisia. At the National Geographic photo gallery, view an artistic rendition of the mausoleum. An earthquake in the thirteenth century damaged the building and Crusaders later used parts of the mausoleum to build a castle. At the British Museum, view artifacts from the Mausoleum at Halicarnassus.

Throughout history there have actually been several temples dedicated to the goddess Artemis in Ephesus. The first was built around 550 BC and survived about two hundred years until fire

destroyed in 356 BC. Construction on a new temple began around 350 BC and the reconstructed temple stood until Ostrogoths razed it around 262 AD. To learn more, watch a History Channel video entitled Seven Wonders: The Temple of Artemis at Ephesus.

Modern day Iraq contains the location for the fifth ancient world wonder, the hanging gardens of Babylon. According to legend, King Nebuchadnezzar had the gardens built to pacify his homesick wife around 600 BC. Descriptions of the beautiful tiered garden exist only in Greek writings. Historians believe an earthquake destroyed the gardens around the first century BC. Explore the gardens by watching all or part of a BBC video Secrets of the Ancients hosted by Google.

The last stop on the tour is Egypt and here tourists will find the Great Pyramids of Giza and the Alexandria Lighthouse. The pyramids are, perhaps, the most well known of all of the wonders. To review, watch a National Geographic video Destination: Egypt Pyramids. Then, learn more about pyramids and their purpose by visiting the BBC interactive sites Pyramid Challenge and Mummy Maker. These two sites challenge the player to successfully build a pyramid and prepare a body for burial.

Unlike the Great Pyramids that are still standing, a series of earthquakes between 936 and 1323 led to the destruction of the lighthouse at Alexandria. For an introduction to this last wonder, watch the History Channel's Seven Wonders: The Pharos Lighthouse at Alexandria. For hundreds of years the lighthouse and much of the ancient city of Alexandria lay hidden underwater until archaeologist Jean Yves Empereur rediscovered their remains. Visit the NOVA site Treasures of the Sunken City and learn about this amazing find. Watch various clips from the documentary including Sphinx Breaks Loose and The Pharos Lighthouse. Then, explore a map of the

underwater archaeological site, and read an interview with Empereur.

As the tour ends, test your knowledge of the seven ancient wonders by completing PBS's Seven Wonders Search. Then, reflect on your journey by writing a journal entry about your travels.

How would this list differ if it someone created it today instead of thousands of years ago? Would any sites from the Seven Wonders of the Ancient World make it onto a new list? Several years ago, Bernard Weber a Swiss filmmaker and museum curator wanted to find out. He asked people from around the world to nominate and vote on seven new wonders of the world. People cast over one hundred million votes and created a new list of Seven Wonders of the World. Listen to a July 9, 2007 NPR program discussing the new Seven Wonders of the World to find out what wonders made the list and view their pictures at the National Geographic Photo Gallery. Despite the differences in the lists, the sites are all truly wondrous and a testament to the ingenuity of humankind.

Reference:

Seven Wonders of the World
http://www.history.com/content/sevenwonders

BBC
http://www.bbc.co.uk

National Geographic
http://news.nationalgeographic.com

The British Museum
http://www.britishmuseum.org/explore/highlights/highlight_objects/gr/c/seated_statue_of_a_man.aspx

Secrets of the Ancients
http://video.google.com/videoplay?docid=-3860132319808135770#

PBS
http://www.pbs.org/wgbh/nova/sunken/

NPR
http://www.npr.org/templates/player/mediaPlayer.html?action=1&t=1&islist=false&id=11829321&m=11829324

NS.K-4.1
Science as Inquiry – including the abilities necessary to do scientific inquiry and understanding about scientific inquiry.

TEKS
112.5. Science, Grade 4
(9) The student knows that change can create recognizable patterns. The student can identify patterns in nature including natural hazards.

Earthquakes and Tsunamis

Alan Sills

Recent events have brought these phenomena into the headlines – let's help our students understand where and how these events tend to occur.

The "Pacific Rim" is alive with activity! Papua New Guinea, Indonesia, American Samoa have all been in the news lately as they experienced either significant earthquakes or a tsunami or both. The reality is that earthquakes and tsunamis are a fact of life in what is known as the "Ring of Fire" by geologists. Use the Web introduce this dynamic and fascinating region to expose students to perhaps the most deadly and destructive phenomena on Earth.

Students will work through online content that facilitates the study of earthquakes and tsunamis in general. Many engaging and interactive visuals are provided to help bring this topic alive as students learn about this highly relevant topic that has recently been in the newspapers around the world.

Fascinating Footage

In today's world where virtually everyone has a video camera on their person, we are able to view events in "real time" as they occur. This first video, recorded by an FBI rooftop security camera (Courtesy ABC News) on American Samoa depicts a tsunami wave tossing around cars like they were matchbox toys on Sept. 29, 2009! Some of the most powerful video footage from the Dec. 28, 2004 tsunami can be viewed here.

Earthquakes can trigger tsunamis. Modern technology has again provided us with a wealth of video footage of these events. National Geographic has prepared a Earthquake Montage of several events designed to provide a real look at "live" events as they occur. Be sure to click "Earthquakes 101" to see fascinating historic photos of the great 1906 San

Francisco earthquake as well as a concise explanation of how earthquakes occur. In less than 3 minutes, Earthquakes 101 introduces an entire unit on earthquakes and plate tectonics. The other videos on this site are also worth the view. Use these as an introduction and a "hook" to prepare students for further study.

Earthquake Dynamics

PBS has provided the Savage Earth Animation designed to help students understand the dynamics of how an Earthquake propagates through the planet. To get the most out of this visual, click each slide, watch the action that ensues, and read the caption. Pause to take questions after each slide. On the third animation, note the time for the p and s-waves to travel through the entire planet – it is on the scale of minutes. Savage Earth has also prepared a complete catalog of animations. On this page, select specific phenomena that you wish to highlight and illustrate. The complete Savage Earth series presents the topic in a clear and coherent fashion. If you have time, consider using this as the core of a unit on Earthquakes and plate tectonics.

The United States Geological Survey maintains a bank of thought provoking photographs. Use these images to illustrate the power of Earthquakes, as well as to generate additional discussion on this topic.

Earthquakes in Real Time

The Incorporated Research Institutions for Seismology (IRIS) has developed the Seismic Monitor, a highly visual interactive tool designed to study earthquakes in real time. Students can easily determine where earthquakes are occurring by magnitude and date. The Pacific "Rim of Fire" is readily detectable as much of the planet's activity occurs along this plate boundary which stretches from the west coast of North America and

South America to the western boundary of the Pacific Ocean. Students will begin to understand that it is no surprise that the headlines are focused on islands and landmasses in and near the western Pacific Ocean.

This image is interactive as well. Click to zoom in on specific locations. The possibilities here for further study are endless. Consider having students study specific regions and determine the relative frequency of earthquakes of varying magnitudes. In other words, how common are magnitude 4 earthquakes when compared to magnitude 6 or 7? Consider incorporating spreadsheets (Excel is the most common) to facilitate analysis. By clicking "last 30 days", either for the globe or a region, a data table appears. This data can be copied and pasted into a spreadsheet. The bottom of the data table reports the number of earthquakes (of magnitude 4 or greater) that have occurred within the past 30 days. A good chart depicting the Richter Scale can be found on the Humanities at the Maelor School Web site.

Tsunamis: How do they occur?

The United States Geological Survey presents a series of simple diagrams on Life of a Tsunami illustrating how a tsunami (also commonly known as a "tidal wave") forms. This page has a series of four "panels" (diagrams with explanations) that detail how the wave forms and then propagates and grows as it nears landfall. Be sure to click the animations link at the bottom of this page. These animations illustrate the action of a tsunami that hits the coast of California.

The Why Files Tsunami page tells a detailed story of how tsunamis impact real people. The page contains a number of diagrams that illustrate the physics of tsunamis. Under the section titled "Adding It Up", there is an animation that illustrates the propagation of a tsunami from its origin. The overhead view with geographic locations mapped illustrates the true scope of such an event. Additional tsunami animations are provided by the British Columbia Emergency Management offices. Each stage illustrates how the tsunami forms from a buildup of stress along a fault boundary. The animation is particularly

effective at helping students understand the three-dimensional nature of what is occurring. The point is made nicely that a tsunami "at sea" is barely detectable and not a hazard to shipping. As the water becomes shallow, the wave grows and becomes a threat to anyone caught in its wake. The impact is then illustrated from an "overhead" perspective where flooding and debris are indicated as the primary risks associated with the tsunami. Lastly, the Navy's Office of Naval Research has prepared an animation that illustrates how a volcanic eruption can trigger a tsunami.

Tsunamis and earthquakes are among nature's most dynamic (and destructive) phenomena. Their study can be the "gateway" to helping students gain a greater understanding of how our planet works. A basic knowledge of earthquakes, earthquake preparedness, and tsunami awareness can be key to survival in an emergency. While much of the United States is not likely to experience either an earthquake of great magnitude or a tsunami, in our highly mobile society, many are likely to visit a region where these events are more common.

Reference:

FBI American Samoa Footage of Tsunami
http://abcnews.go.com/Video/playerIndex?id=8795735

ABC News
http://abcnews.go.com

Dec. 28, 2004 Tsunami Video Footage
http://www.masternewmedia.org/news/2006/12/08/tsunami_video_key_video.htm

Masternewmedia
http://www.masternewmedia.org/

National Geographic Earthquake Video
http://video.nationalgeographic.com/video/player/environment/environment-natural-disasters/earthquakes/earthquake-montage.html

National Geographic
http://www.nationalgeographic.com

Savage Earth – The Restless Planet – Earthquake Animation
http://www.pbs.org/wnet/savageearth/animations/earthquakes/index.html

Savage Earth – The Restless Planet – Home page
http://www.pbs.org/wnet/savageearth/earthquakes/index.html

Savage Earth – complete catalog of animations
http://www.pbs.org/wnet/savageearth/animations/

PBS
http://www.pbs.org

U.S.G.S. Selected Earthquake Photos
http://earthquake.usgs.gov/learning/photos.php

U.S.G.S. Photographic Library – Earthquakes
http://libraryphoto.cr.usgs.gov/earth.htm

U.S.G.S.
http://www.usgs.gov

IRIS – Seismic Monitor
http://www.iris.edu/seismon/

IRIS
http://www.iris.edu

Richter Scale
http://www.maelor-humanities.org.uk/GCSEhum/Resources/PP-photos/pp-KeyIss3/Richter.scale.jpg

Humanities at the Maelor School
http://www.maelor-humanities.org.uk

Life of a Tsunami
http://walrus.wr.usgs.gov/tsunami/basics.html

Tsunami Animations – California Coast
http://walrus.wr.usgs.gov/tsunami/persistence.html

Tsunamis – animation
http://whyfiles.org/068tsunami/index.php

Why Files
http://whyfiles.org

Tsunami Animation
http://www.pep.bc.ca/tsunamis/causes_2.htm

British Columbia, Emergency Management
http://www.pep.bc.ca

Tsunami Animation
http://www.onr.navy.mil/Focus/ocean/motion/waves3.htm

Office of Naval Research
http://www.onr.navy.mil

Introducing Bar Graphs

Kira Hamman

NM-DATA.3-5.2
Select and use appropriate statistical methods to analyze data

TEKS
§111.15. Mathematics, Grade 3.
(13) Probability and statistics. The student solves problems by collecting, organizing, displaying, and interpreting sets of data. The student is expected to:
(A) collect, organize, record, and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data;
(B) interpret information from pictographs and bar graphs;

What mathematical topic involves students chatting about their favorite colors and animals, counting (and eating) candy, and creating colorful pictures? Graphing, of course!

Graphing is an important part of the elementary mathematics curriculum. Graphs appear all around us: in newspapers, in magazines, on television, on billboards. Therefore, the ability to read graphs is a critical quantitative literacy skill for informed citizens. In addition, graphs introduce students to data collection and data analysis as well as to the idea that mathematical ideas can be presented visually.

Introducing Bar Graphs

To introduce the idea of a bar graph, or to review it with students who have seen it before, play the game Bugs in the System from PBS kids. Before playing the game with the class, click Instructions and read them with students. Then click Play and play the first room as a demonstration. Next allow students to play through the rest of the rooms at their own computers. Note that the number of bugs increases with each room, and that the scale on the graph can be altered with the slider directly under the room.

Creating Bar Graphs

After the game, give each student or group of students a small cup of jellybeans and a copy of the Counting Jellybeans worksheet from Enchanted Learning. Ask them to sort their jellybeans by color and then fill in the graph and answer the questions below it. Additional worksheets are also available, although some of them require a free membership to the site for printing.

For older or accelerated students, the Create A Graph site, maintained by the National Center for Education Statistics, is a wonderful tool. With younger students, you may prefer to use Create A Graph Classic, which is also a great graph-making tool but is somewhat simpler to use than the newer version. Both versions have excellent instructions and tutorials. It is a good idea to go through these with the students before using either site so that they have a better idea of what to expect.

Create a graph on one of the sites using the data students collected while working on the Counting Jellybeans worksheet. To use the simpler Create A Graph Classic:

- Choose Bar Graph from the drop down menu.
- Click Create a Bar Graph.
- To see an example of the tool, click the link to "fill with education data from NCES", then click Create Printable Graph.
- Use your browser's back button to return to the previous page and enter the necessary data for the jellybeans. Title the graph and the axes and enter the color names as the bar names. Enter the number of each color in the field for value, and let students choose the bar color for each bar. It is fun to have the bar color match the jellybean color!
- Click Create Printable Graph. If you have access to a color printer, you can allow students to print the graphs they have created.

To do the same activity in Create A Graph:

- Under Type of Graph, click Bar.
- Fill in your desired Direction, Shape, and Style options.
- Click the tab for Data and fill in the graph and axis titles. For fun, students can list themselves as the source of the data.
- Set the number of items to the number of colors of jellybeans the students had, and leave the number of groups at one. Later, you can allow students to compare

data by adding another group and another student's data for a side-by-side graph.

- Give the group a name, such as the name of the student who collected the data.
- Enter the colors as the item labels and enter the number of jellybeans of each color as the corresponding values.
- Choose appropriate maximum and minimum values for the y axis.
- For now, there is no need to change anything in the Labels tab, although feel free to have students experiment with this later.
- Click Preview to see your graph.
- Click Print/Save to download, print, or email the graph.

Once students have had to opportunity to get comfortable making a bar graph with the jellybean data, ask them to make another graph with new data. If time permits, conduct a class or school survey to collect data for the graph. Alternatively, ask students to collect some type of data as homework. With older students, you or they can collect data from an Internet source. The National Center for Education Statistics, which created these tools, is an excellent source for data, as are the Centers for Disease Control and Prevention and the U.S. Census Bureau.

Other Types of Graphs

Line graphs and circle graphs are two other types of graphs that come up frequently in the elementary classroom. Both of these can be explored in the Create A Graph sites given above using the data students collected in the jellybean activity. Additional resources for line and circle graphs include the lesson M&Ms: Line Plots and Graphing and the Circle Grapher, both from the National Council of Teachers of Mathematics.

Graphing is a powerful tool in mathematics. Graphs allow us to present data in a visual form, making it easier to see trends and compare different sets of data. Graphing at the elementary level also sets the stage for both statistical graphing and algebraic graphing later on. Happily, most students enjoy collecting data and making graphs, so this important topic is also fun to teach!

Reference:

PBS Kids Cyberchase: Bugs in the System
http://pbskids.org/cyberchase/games/bargraphs/bargraphs.html

Enchanted Learning: Graph the Jellybeans
http://www.enchantedlearning.com/math/graphs/jellybeans.shtml

Enchanted Learning: Bar Graphs Printouts
http://www.enchantedlearning.com/math/graphs/bargraph/

National Center for Education Statistics: Create A Graph
http://nces.ed.gov/nceskids/createagraph/

National Center for Education Statistics: Create A Graph Classic
http://nces.ed.gov/nceskids/graphing/classic/

National Center for Education Statistics
http://nces.ed.gov

Centers for Disease Control and Prevention: FastStats
http://www.cdc.gov/nchs/FASTATS/

U.S. Census Bureau
http://www.census.gov

National Council of Teachers of Mathematics: M&Ms: Line Plots and Graphing
http://illuminations.nctm.org/WebResourceReview.aspx?ID=144

National Council of Teachers of Mathematics: Circle Grapher
http://illuminations.nctm.org/ActivityDetail.aspx?ID=60

The Statue of Liberty

Courtney Kincaid

At a dinner party in 1865, Edouard Laboulaye proposed a monument to liberty and to United States Independence - and by 1886 France's amazing gift, the Statue of Liberty, took her place as an American landmark.

The Statue of Liberty has come to be a symbol of the United States' ideal of freedom, and of the United States itself. Two countries cooperated to create a new Colossus, one that would be known all over the modern world. Students focus on the amazing history of the Statue via the World Wide Web. They will learn fun facts about the statue, its creators, its meaning and the poet who wrote the famous words at its base. They will enjoy viewing photographs and browsing stamps and coins depicting Lady Liberty.

Industrial United States (1870-1900)

- Understands how the rise of corporations, heavy industry, and mechanized farming transformed the American people
- Understands massive immigration after 1870 and how new social patterns, conflicts, and ideas of national unity developed amid growing cultural diversity
- Understands the rise of the American labor movement and how political issues reflected social and economic changes

TEKS
§113.7. Social Studies, Grade 5
(18) Citizenship. The student understands important customs, symbols, and celebrations that represent American beliefs and principles and contribute to our national identity. The student is expected to:
(A) explain selected patriotic symbols and landmarks such as the Statue of Liberty and the White House and political symbols such as the donkey and elephant;

Meet Lady Liberty

Many students will have heard of the Statue of Liberty, but how much do they know about the Statue and its history? Engage prior knowledge by posing some introductory questions. What does the Statue of Liberty look like? How tall do you think it is? Does anyone know whether the Statue has a special meaning? Why does she wear a crown? Where do you think the statue came from? Record student responses on the classroom board.

Explain to students that in this lesson, they will be researching the answers to these five questions about the Statue of Liberty. For a concise introduction, use a classroom computer with an attached projector to visit The Stature of Liberty page at Ben's Guide to the U.S. Government, a site by the U.S. Government Printing Office.

Students will learn about the meaning of the seven spikes of Lady Liberty's crown, and the history of nearby Ellis Island.

A Very Special Gift

Whose idea was this incredible gift from France, and why did the French want to give the United States this gigantic statue? Continue researching and learning about a very historic dinner party in this National Geographic Kids article, The Light of Liberty. Use the "next" link to navigate from page to page. This site has an excellent close-up of Lady Liberty, and a fun Fast Facts section.

Dig a little deeper into the history of the Statue of Liberty with the Statue of Liberty-Ellis Island Foundation's Statue of Liberty Resources. There is something for everyone here. Talented and gifted students will love the Statue History link, while all students will enjoy the Statue Fun Facts, where you will find a diagram showing the dimensions of the the Statue of Liberty along with many other interesting bits of information about the Statue. Special needs and English language learner students may especially like the Statue Pictures and the Stamps and Coins pages.

"Give me your tired, your poor/your huddled masses yearning to breathe free…" did your students discover the Statue of Liberty's inscription in their research at the Web sites above? What does it mean, and what inspired the author to write these words? Visit PBS Kids Big Apple History's Emma Lazarus page to find out.

Two video clips from PBS, The Statue of Liberty discuss the important elements of liberty. Watch the brief videos and then ask students to draw a picture that represents what liberty means to them. They should include a description of their image as well.

If time permits, discuss the massive effort undertaken to renovate and restore the amazing Statue. Watch History in the Making: Statue of Liberty Renovation from HowStuffWorks. For some wonderful bell-ringer activities, check out thestatueofliberty.com's Games for Children of All Ages.

Make Your Own Statue

Wrap up this lesson in style with a fun extension activity: go to PaperToys.com and print this Statue of Liberty paper cutout. Students will have fun cutting out and folding this paper model of the Statue. Allow students to mount their statues at the top of piece of construction paper. Below the statue, have students paste lined paper to answer the five questions from the beginning of the lesson - What does the Statue of Liberty look like? How tall is it? Does the Statue have a special meaning? Why does she wear a crown? Where did the statue come from?

Frances' amazing gift to the United States, and the cooperation of the two countries, led to the erection of a monument to freedom known throughout the modern world. Students can take many important lessons from the history of the Statue of Liberty to carry into their lives beyond school. Lady Liberty's history teaches us about cooperation, the importance placed on freedom by our forefathers, and the possibilities that can arise from one person's very big idea.

Reference:

Ben's Guide to U.S. Government for Kids – Statues and Memorials: The Statue of Liberty:
http://bensguide.gpo.gov/3-5/symbols/ladyliberty.html

National Geographic Kids – The Light of Liberty
http://kids.nationalgeographic.com/Stories/History/Statue-of-liberty

Ellis Island Foundation, Inc – The Statue of Liberty
http://www.statueofliberty.org/default_sol.htm

The Statue of Liberty – Games For Children of All Ages
http://www.thestatueofliberty.com/liberty_games.html

PBS Kids – Big Apple History: Emma Lazarus
http://pbskids.org/bigapplehistory/immigration/topic6.html

PaperToys.com – Statue of Liberty
http://papertoys.com/statue.htm

Aaron Copland: The American Composer

Natalie Clarkson

Name _____

On November 14, 1900, one of America's most celebrated composers of concert, ballet, and film was born. His name was Aaron Copland. He was interested in music at an early age. As a child, Copland learned the piano from his older sister.

Then, by the time he was fifteen, he had already decided to be a composer. For over thirty years during his peak, Copland wrote countless music arrangements.

In this month's Internet Challenge™ you will learn more about the composer, Aaron Copland, and listen to his music. Are you ready to start?

Begin this journey by reading about Aaron Copland at the PBS web site. Browse to http://www.pbs.org/wnet/americanmasters/episodes/aaron-copland/about-the-composer/475/

Read the page and begin answering the first set of questions.

1. Aaron Copland first learned the piano from his older sister. Then he studied music from a music instructor, Rubin Goldmark. In addition, he learned more about music by doing what?

2. At the age of 20, Copland left for music school in:

   a. Italy

   b. California

   c. New York

   d. France

3. What was his entry into the life of professional American music?

4. For Copland, _____ "was the first genuinely American major music movement."

   a. jazz

   b. classical

   c. rock & roll

   d. bluegrass

5. During the 1930s, Mr. Copland was dedicated to broadening the audience of jazz music. He became a leader among jazz composers.

   a. True

   b. False

6. In search of a larger audience, Copland began composing for movies. Name two films for which he composed the score.

7. Consider the time period between 1950 and 1970. Would this be considered a time during which Mr. Copland was prolific or productive as a composer of original works? Support your answer.

8. "As an older man, Mr. Copland spent his time in an attempt to ***elevate*** the status of American music abroad, and to increase its popularity at home."

   Which of the following words is a synonym for ***elevate***?

   a. decrease

   b. heighten

   c. lessen

   d. condemn

Super start!

Now visit The Library of Congress's Performing Arts Encyclopedia: Copland's "Fanfare for the Common Man." Find this resource by browsing to http://lcweb2.loc.gov/diglib/ihas/loc.natlib.ihas.200000006/default.html.

After reading the overview, be sure to listen to the sound recording (http://lcweb2.loc.gov/diglib/ihas/loc.natlib.ihas.100010429/default.html). You will need to choose your audio format.

9. "Fanfare for the Common Man" is a classical composition written by Copland in response to a **solicitation** from Eugene Goosens, the conductor of the Cincinnati Symphony Orchestra.

   Choose the best definition for **solicitation**.

   a. Priority in refusing or taking something; option

   b. A written or printed communication

   c. A form of communication in spoken language

   d. A petition or request

10. Mr.Goosens originally wanted this work of music to honor whom?

11. Upon completion, who was the audience of the final piece?

12. Why did Goosens and Copland decide to preview "Fanfare to the Common Man" on March 12, 1943?

13. Explain why taxes had become a major issue for the common man.

14. Now, listen to the U.S. Marine Band sound recording. In your own words, describe what you hear.

Fantastic!

It is time to listen to more of Copland's masterpieces. Visit the Dallas Symphony Orchestra's Listen by Composer site found at www.dsokids.com/listen/ComposerDetail.aspx?composerID=43.

Listen to "Hoe Down," "Gun Battle" and "Fanfare for the Common Man." Answer the remaining questions.

15. Which of the works, if any, were familiar to you?

16. Copland's music compositions paint a picture. Describe the picture you *see* when you *hear* "Hoe Down."

17. After listening to the three music samples, which one do you prefer? Why? Explain.

18. How is Aaron Copland's music similar or different to the music genre you listen to daily? Explain.

Super Responses!

Extension Activity – Do one or both of them!

- Aaron Copland's musical compositions are still relevant today. For years, the National Cattlemen's Beef Association has used "Rodeo" in its commercials. Imagine that you and a partner work for an advertising company, and you have been asked to create a new commercial for the National Cattlemen's Beef Association. Watch a past commercial YouTube - Beef Ad 1994 located at http://www.youtube.com/watch?v=7VvvAp-2v4o. Why do you think the previous advertising company decided to use "Rodeo" in this commercial? How did the music work with the overall message of commercial? As the new advertising company, would you suggest that the association continue incorporating "Rodeo" in the background of the ad? Why or why not? Prepare to deliver your supported answers to the class.
- Another one of Copland's more famous works was Appalachian Spring, a ballet. At YouTube you can watch this beautiful1944 ballet featuring Martha Graham and Merce Cunningham. Go to http://www.youtube.com/watch?v=aEvcP-vXk4M. While viewing the ten minute video, watch how the music and dance movements work together. Write a review of the music how it impacts the ballet performance.

Congratulations! You have done a super job on this month's Internet Challenge™.

Answers to November's Internet Challenge™

1. In addition to the music instruction, Aaron Copeland learned more about music from attending performances at the New York Symphony and Brooklyn Academy of Music.
2. D
3. In 1925, Copeland wrote "Symphony for Organ and Orchestra" for the Boston Symphony Orchestra as requested by Serge Koussevitsky.
4. A
5. B
6. The movies that Copeland composed for include: "Of Mice and Men," "Our Town" and "The Heiress."
7. No.
8. B
9. D
10. Mr. Goosens originally wanted the musical request to honor the World War II soldiers.
11. The audience was the common man or every man.
12. They decided the preview on March 12 because tax day was on March 15. They thought this would be an excellent time to honor the common man.
13. In 1943, taxes were a major issue. Government spending soared as the U.S. had been at war for fifteen months. Taxpayers or the common man were struggling to pay the rising taxes to the federal government.
14. Students' own answers.
15. Students' own answers.
16. Students' own answers.
17. Students' own answers.
18. Students' own answers.

Extension Activities – Students' own answers.

Estimated Time: 50 Minutes

Planet Hunting Tops 400

Lisa Kerscher

TEKS
§112. 33. Astronomy
(6) Science concepts. The student knows our place in space.
(A) compare and contrast the scale, size, and distance of the Sun, Earth, and Moon system through the use of data and modeling;
(B) compare and contrast the scale, size, and distance of objects in the solar system such as the Sun and planets through the use of data and modeling;
(C) examine the scale, size, and distance of the stars, Milky Way, and other galaxies through the use of data and modeling;
(D) relate apparent versus absolute magnitude to the distances of celestial objects; and
(E) demonstrate the use of units of measurement in astronomy, including Astronomical Units and light years.

On October 20, 2009, an international team of astronomers announced that 32 new planets had been discovered outside of Earth's solar system. Such extrasolar planets, also referred to as "exoplanets," now total 403. The planet hunters found this latest group of exoplanets using the High Accuracy Radial Velocity Planet Searcher (HARPS), the spectrograph for the European Southern Observatory's 3.6-metre telescope in La Silla, Chile. With more than 76 exoplanet discoveries to its credit, the HARPS is quickly becoming a favorite planet hunting tool.

A lot of time and money is spent on planet hunting. These efforts are not merely for the sake of science itself, however. Many hope to ultimately find at least one or more Earth-like rocks that might someday be colonized by humans.

This month's exploration begins with a journey through our solar system to help you become better acquainted with our neighboring planets. You will then leap outside of our neighborhood to get a peek at worlds beyond.

Planets On Exhibit

Before jumping into outer space, take some time for training at the Smithsonian Institution's Cyber Center. This training is not to prepare you for spaceflight, but to give you some experience creating planet exhibits for the museum. You will need this training when you explore the solar system more in-depth later. Register as a new user if you want to return to the center later; otherwise, skip registration and go straight to Level 1, serving as an Intern.

Use the side menu to review your Assignment, and then review the Process: Choose Images, Tell Why, Write Labels, and then Make Exhibit. On your Intern's Desktop, you'll see a Photo Album, Researcher's Notes, and a place to write Labels.

Browse through the Photo Album and read the Researcher's Notes. Decide how you want to use the images to tell about one planet or compare one planet to another in some way. Print out each exhibit panel and paste on poster board or hang on a wall. Write a summary of your exhibit, using intern Mike's Summary as a model. When you are done, pair up with a partner and use the Evaluation to analyze each other's exhibit.

In Your Own Backyard

With your exhibit partner, start your outer space tour with a Solar System Exploration at NASA. Read the introduction that explains the definitions of planet and plutoid. Then, start exploring some of the planets, such as Mercury, Venus, Saturn, etc. Also, review the non-planet entries in the list, including Asteroids, Oort Cloud, and Dwarf Planets.

After getting familiar with the list of planets and non-planet entities, you and your partner should pick one clear theme for a new exhibit you will create using information from this web site. Similar to your training experience at the Cyber Center, you should:

- Choose and print out three or more images
- Tell why you chose those images, making sure to include key facts or descriptions from your research
- Write a label for each image
- Create your exhibit by pasting your images and other materials on poster board
- Include a title that explains your exhibit's theme
- Describe your exhibit in a one-page summary

As an evaluation, rate how well another team's exhibit meets the following criteria areas:

- Theme Content—exhibit's images and other materials match and support the exhibit's theme title
- Information Accuracy—included facts or descriptions are accurate (evaluators should check the website to verify)
- Writing Style—summary and labels are written clearly, using correct grammar and punctuation

For each criteria area, discuss your analysis with your exhibit partner. Together, rate the exhibit on a scale of one to five (with five being "Excellent.") In areas you and your partner did not give a rating of five, state the reasons and suggest one or more ways to improve this part of the exhibit. Remember to be specific and helpful since your own exhibit will receive a similar critique.

Give your evaluation to the exhibit team. With the evaluation of your exhibit done by another team, review it and use any suggestions to improve your display. Ask the evaluators questions, if something they wrote is not clear.

Exoplanet Exploration

Now, take off on a PlanetQuest to check out worlds beyond our solar system. Start with The Big Story of the historic timeline. The slideshow will autoplay with narration, unless you turn off the autoplay and sound using the controls near the bottom of the screen. For each stop along the timeline, record the date and summarize the milestone in one to three sentences. Share with classmates one aspect in the timeline that you thought was especially interesting and why.

Next, visit the website's Multimedia gallery. From here, jet into the 3D New Worlds Atlas. When you get to the Star Map, you will automatically get a guided tour of how the atlas works. After the guided tour ends, click to explore an exoplanet location on the map. Once you zoom into that location, click the planet or planets circling that sun. Record the data known about each object. Return to the map to pick your next research area. Your mission is to explore a total of three exoplanet areas.

For each exoplanet you research, draw an illustration that mirrors the 3D atlas entry and record its type, mass, orbital radius,

and orbital period. Also, note the method of detection and the constellation, if applicable.

In your research, you likely came across at least one method of discovery—Radial Velocity, Astrometry, Transit Method, or Optical Detection. For an explanation of these methods, discover the Four Ways to Find a Planet. For each method, write a short summary and draw helpful diagrams that describe how it works.

For each exoplanet you researched, write a paragraph comparing and contrasting it to our Sun, Earth, or another planet within our solar system. You may also want to compare one exoplanet to another exoplanet, especially if the detection methods were different. Discuss your exoplanets with classmates for further comparison.

Reference:

Smithsonian Institution – Cyber Center
http://www.nasm.si.edu/education/cybercenter/planets/cybercenter.htm

NASA – Solar System Exploration
http://solarsystem.jpl.nasa.gov/planets/index.cfm

NASA – Planet Quest
http://planetquest.jpl.nasa.gov

Facebook Privacy Settings for Teachers

J. Alan Baumgarten

The best teachers become life-long role models for their students, and Facebook offers a popular means of staying in touch with students. But there are legitimate concerns that all teachers should have about exposing too much of one's personal life to students. Fortunately, there are some tools and settings in Facebook that can help mitigate these concerns.

Several of my friends and relatives are educators who are still teaching in public schools. Others have retired from teaching or moved on to other opportunities. I have them as friends in Facebook, and we keep in touch occasionally through this tool. I also know from reading their wall posts that they have current and former students as friends as well, which got me thinking about Facebook and teacher/student etiquette.

I belong to what appears to be a minority of teachers who think it is alright to associate with students on Facebook. Critics of teachers on Facebook believe it is too dangerous, that it erodes the distance that a respectful teacher/student relationship requires. I wonder if Mr. Chips would have used Facebook if such a thing existed. Given his philosophy of education, I believe he would. But clearly there are boundaries, even if they aren't clear. It is wise for teachers to uphold a healthy separation of personal and professional life. It is wise to avoid over-exposure of your private affairs, and also to safeguard your personal circle of friends. Teachers much also be mindful of the privacy and security of students' personal information, which may include comments to you. There needs to be a balance.

In this Geek Tutor article I will show you some tools and strategies aimed squarely at achieving and maintaining the right balance, allowing you to maintain and foster lifelong friendships with students for whom you are a profound influence.

Create Facebook Lists

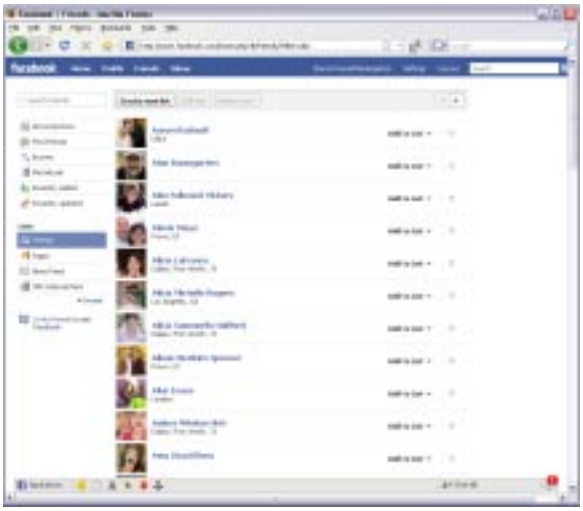
Like most applications, Facebook's functionality is based on rules and settings. By default, Facebook lets everyone see and do pretty much everything – that's the whole point of a social network.

It's up to you to decide what to lock down, but you don't want to restrict everyone from doing everything; that would ruin the whole experience of social networking. The solution is to separate your Facebook friends into different groupings—called Lists in Facebook—and to grant different permissions to the different groups. It's not as difficult as it sounds. If you can set up and manage email folders, Facebook Lists will be a breeze.

First we will create a few lists, and then we will configure some privacy settings for these lists.

Start by opening Facebook and browsing to the Friends page by clicking the link at the top. By default, Facebook thinks you want to find new friends. See the highlighted option on the right? Below it, down a few, you will see a category heading called ***Lists***. The Facebook default list is called Friends. Unless you specify otherwise, every person you add in Facebook gets put into that single Friends list with the same permissions.

Click the Friends list. Above your list of friends you will see an option to "Create new list." Click it, and in the dialog that opens, enter a name for a new list you want to create. Enter the name "Current Students" (or something similar) where it says "Enter a name." If you don't have any current students and want to create a list for Colleagues, that would be fine for now. Below the new list name, you will see a table of every friend you have in Facebook. Click the photo or name of any friend you want added to this new list; scroll down and choose as many as you want. Finish by clicking Create List.



You will now see Current Students on the left side below ***Lists***, and when you return to your Facebook Home page, you will see it there on the left as well. Click it to see wall posts exclusively for this group.

You can create other lists as well—for family, professional colleagues, college or high school buddies, neighbors, and so on. Keep in mind that your friends can

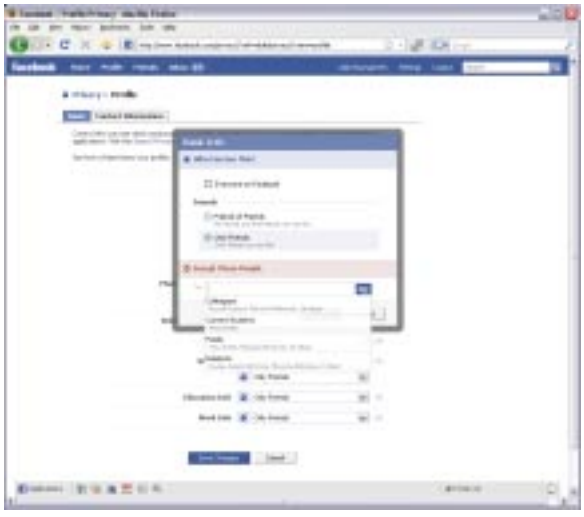
belong to more than one list. Just keep your current students completely separate from your other friends, and consider different lists for current and former students.

Privacy Settings for Lists

Now that you have one or more lists defined, with friends added to them, you can specify custom privacy settings for each list. We will focus on privacy settings that restrict what friends can do and what they can see with respect to your Facebook account.

To access your privacy settings, hover your mouse over the Settings link (top right) and choose Privacy Settings. On the Privacy page, you will immediately see that there is an option to block anyone you want from having anything to do with you on Facebook. Read the statement carefully, and if you wish to block any of your students—or anyone you know at all—from finding you on Facebook or knowing anything about you, enter the person's name and/or email address and click Block.

For less draconian precautions, choose the Profile option on the page. This gives you more granular control over your friends' access. Unfortunately, it's not very intuitive, but I can walk you through it.



For each part of your Facebook profile listed, you can specify who can access it. This can be done individuals or for lists. We want to choose the latter, specifically for the Current Students list. Let's start with **Basic Info**, which is all of the information you entered in your Profile under the Info tab within the Basic Information heading: gender, birthday, relationship status, political views, and religious views. If you don't want current students to know any of this, click the Basic Info drop-down and choose Customize. By default, your friends can see this information; however, at the bottom

of the dialog is an option to name exceptions—people who are your friends but who may not see your Basic Info. Click the form field, and then click the List icon on the right side of the field once it becomes active. Choose Current Students from the drop-down, and then click Okay. Everyone in your Current Students list, and anyone you ever add to this list in the future, is now restricted from seeing your basic information.

Follow the same procedure for the other profile options listed. Don't forget to click the Contact Information tab at the top and do the same for your personal contact details. For example, you may not want students to access your address and personal email account.

To learn about any of the profile options, click the [?] link next to each one. I personally recommend restricting current students from seeing your friends, personal info (if it is sensitive), photos and videos tagged of you, and possibly even wall posts. Most Contact Information is usually best kept private as well.

Many more tips for tweaking Facebook are available online.

Reference:

Facebook
http://www.facebook.com

Global Collaboration on the Web

Stephanie Tannenbaum

Now that the Internet is an integral part of everyday life for many, it is time to take the Web to the next level in the classroom. Encouraging student collaboration is a current trend in educational pedagogy; take this effective trend to new heights by opening up the realm of collaboration to students in far away locations such as China, England, and Australia.

Today, the Internet reaches children of all ages in schools all around the earth. The World Wide Web has truly brought the vast world into individual classrooms. Furthermore, the Web presents a global perspective directly to students' desktops. The capabilities and dimensions of Web sites have evolved immensely over the past decade. Gone are the days of reading through massive blocks of text on the screen. Web sites now include a host of media such as selections of primary source documents, pod casts and other audio clips, photographs, videos, virtual tours, interactive java-style applets, and demonstrations. Innovative software freely permits and encourages Internet visitors to meet other visitors in the online environment. The social networking age is in full swing with the likes of MySpace and FaceBook.

Students will find that working on projects with classrooms from a host of other countries around the world bring in a global perspective that would otherwise be unavailable in a typical K-12 curriculum.

How do I Collaborate Internationally?

The U.S. Department of Education's International Education Initiative currently is on the forefront; promoting interaction between students in the United States and students in other countries around the world. The ED Teacher's Guide to International Collaboration on the Internet provides in-depth

information and a framework to follow for this ambitious project. This online resource provides complete background, directions, and examples of various projects by grade level. It is worth it to spend some time reading the information before implementing any international collaboration project in to the classroom.

Scroll down to Tips for Online Collaboration. Read the top ten list. This will provoke thinking about what you can and cannot do with your students and give you ideas on what makes this endeavor successful. As you can see, there are many points to review and research with students before embarking on an international project such as learning about the culture, language, land, society, and more. Continue reading the remainder of this page. Impressing upon students to convert and use metric and universal systems is of utmost importance for efficient communication.

Next, review the Helpful Suggestions from K-12 Teachers. The questions and answers are important components to learning about what to look for and how to make a digital project successful across international borders. Obviously, much depends upon the grade level of students. Younger students will require more guidance and an alternative to email format for communicating (which is addressed in this guide). Older students will have more autonomy in working with other students online but all writing should still be monitored.

Learn more about online collaboration at the Virtual Architecture's Web Home (by Judi Harris from the College of William and Mary) and take the complete tour around this Web "home." Start at the beginning and visit each section of the "home" to learn more about "telecollaboration." Find out about the different types of digital communication and the immense possibilities that exist. Each section provides thorough explanations as well as helpful links to additional resources. From the third set of tips, we extract the theme of some very important terms; "embrace," "experience," "understand," and "honor." Write these terms on the board and invite students to look up definitions. Then ask students to provide sample sentences where they use each term. Hold a brief class discussion about why these terms are important when working with students from other countries.

Go (International) For It!

So now it is time to try it out. The Give Something Back International Foundation's Global Virtual Classroom is an excellent program to try. Read the introduction and then note the GVC Participants from Around the World. If you are not already excited about the possibilities of this type of project, you will be after realizing the vast reach this program has already extended! Now let's learn more. Click the Clubhouse Overview and review all four tabs. Continue learning more with the Contest link and read the information in the tabs. Make sure to look at some of the Past Winners for ideas. Now you are ready for the Application process. Global Virtual Classroom is an excellent program for first-time international collaboration projects.

Global SchoolNet is a similar high-standard program that helps teachers to set up classroom projects that students can collaborate with classrooms from other cities and countries. Under the Collaborate Now tab, click Take a Tour of GSN to get an overview of this program. There is a list of links to peruse; certainly visit each link as they are quite insightful. The Collaborative Learning Center provides a host of online tools to help you get your classroom on the way to an exciting project. Once you are familiar with Global SchoolNet, you are ready to browse the Project Registry and get started!

We place immense emphasis on encouraging students to collaborate on projects in the K-12 curriculum. With the World Wide Web, the natural place to extend that collaboration is truly throughout global classrooms. Working with classrooms from other countries allows students to learn about and appreciate the cultural, geographical, and political perspectives from students of their same age while continuing to focus on all forms of literacy, social studies, science, math, history, and the arts.

Reference:

U.S. Department of Education – ED Teacher's Guide to International Collaboration on the Internet
http://www.ed.gov/teachers/how/tech/international/index.html

Judi Harris of the College of William and Mary – Virtual Architecture's Web Home
http://virtual-architecture.wm.edu

Give Something Back International Foundation Global Virtual Classroom
http://www.virtualclassroom.org

Global SchoolNet
http://www.globalschoolnet.org

Peace Corps Lesson Plans
http://www.peacecorps.gov/wws/educators/lessonplans/