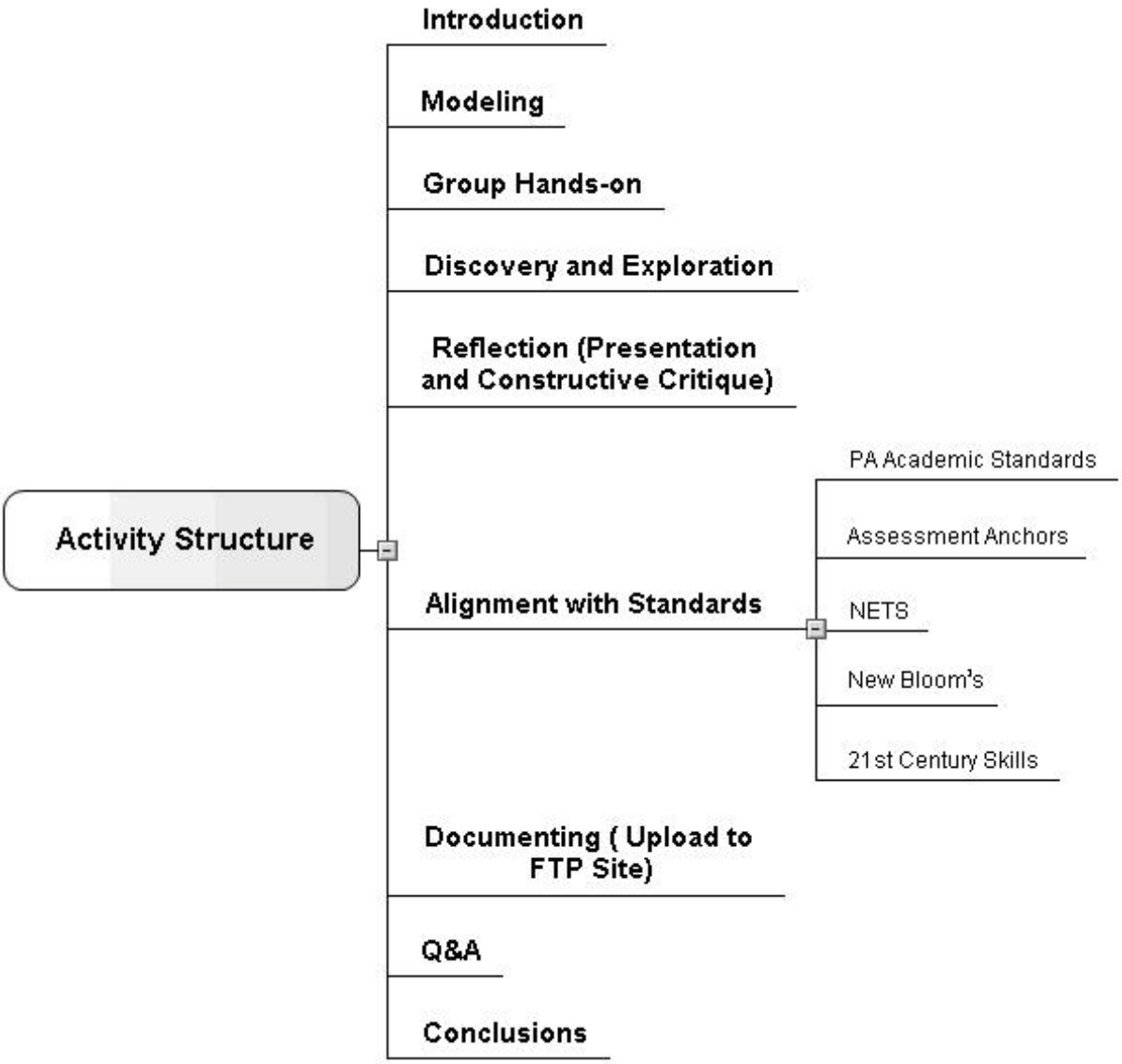
21st Century Activity Featuring Infusing Technology



Infusing Technology
An Expedition Using Google Earth

1. Introduction

Introduction

An assessment is a valuable way to provide an analysis of needs and skills learned. With the explosion of the various technologies in the classroom, facilitators, now more than ever, must become competitive users in the ever-evolving world of technology. By integrating technology into the classroom curriculum, facilitators can provide learners a platform for sharing, organizing and communicating with others in real world applications. This integrated technology lesson allows facilitators to teach content while manipulating and learning how to use existing technology.

Description

Using the Internet-based tool *Google Earth*, learners will work in teams and take a one-week virtual trip to a location of their choice. *Google Earth* will allow them to develop a resource others can use and learn from by creating a series of descriptive Placemarks in a *Google Earth* file.

Suggest that the learners copy and paste any useful information from the Internet and *Google Earth* into separate *Word* documents. Remind them to consider the audience when developing the writing for their Placemark information.

Web sites:

Google for Educators: http://www.google.com/educators/p_earth.html
Google Earth User's Guide: http://earth.google.com/userguide/v4/
Google Earth Tutorial: http://earth.google.com/outreach/tutorials.html

Materials

Web browser

Google Earth

Microsoft Word 2007

Microsoft Excel 2007

Prerequisite Skills

Learners should have a working knowledge of *Google Earth*, the Internet, *Word* and *Excel*.

Suggested Time Allotment

Four class periods plus collaborative work and research outside of school hours

Classroom Content Areas Addressed

Social Studies (Geography and History)

Mathematics

Reading, Writing, Speaking and Listening

Activating Prior Knowledge

- The facilitator will ask learners about trips they have been on and how they "tracked' their journey (journal, pictures, and video). Show sample *Google Earth* tours to give students ideas of the concept and to spark their imaginations
- The facilitator will use the learner input from the activation strategy to contextualize the lesson.

2. Modeling

1. The facilitator will explain the purpose and criteria of the assignment to the learners.
2. The facilitator will model how to access resources using the Promethean Board.
3. Using learners, the facilitator will model each role assignment.
4. The facilitator will discuss the rubric for evaluation and model examples of expected work quality.

3. Group Hands-on

While all learners are contributing to the completion of the finished product, each learner within the group has a responsibility.

Learner 1: Cartographer: This learner's responsibilities include leading the *Google Earth* file development. This learner should have average *Google Earth* skills.

Learner 2: Journalist: This learner will enter the information in narrative form using *Microsoft Word*, making sure all sources are cited appropriately.

Learner 3: Researcher: This learner will search for and archive images and textual information from the Internet that relate to the team's journey.

Learner 4: Planner: This learner is responsible for leading the "storyboarding" route mapping of the group's project and will work to make sure the project is stays on pace and on track. This learner will also lead the development of the budget for the trip.

4. Discovery and Exploration

Extensions

Learners can use *Google Earth* to:

- Develop a map of their community
- Create a file tracing their family's ancestry
- Map out the game results over the course of a sports season
- Graphically document science-related information such as drought, flooding, deforestation, etc.

PowerPoint slideshows are a great way for students to document and share their learning. As an add-on to this project, as students develop their *Google Earth* resource, they can grab screen captures to use in a slideshow. This is also very useful to show the information without Internet connectivity.

Technology Enrichment

1. Learners can plan and design a Web page based on their journey. They can use much of the same information they used in their journey file. This is especially useful if the audience does not have *Google Earth* to view the file. Learners can also include external links to Web sites associated with their journey.
2. Learners can conduct an online search for blogs related to their journey. They will be able to learn more about the places they "visited". They can share their files with others or use the information to plan their own real trip.
3. Learners can subscribe to RSS to keep up-to-date on places they learned about in their journey.

5. Reflection (Presentation and Constructive Critique)

- What was the purpose of structuring the lesson as a group activity?
- How did the groups organize themselves?
- How did individual groups plan collaboration with other groups? Was it effective? Was it efficient? If not, how might you provide guidance without being prescriptive?
- What were some of the organizing strategies that groups used?
- Did they utilize technology for organizing? For planning? For tracking progress? For communicating progress on the project?
- Was there equitable distribution of work?
- How did you track individual accountability?

- How did the facilitator provide scaffolding while refraining from being prescriptive?
- To whom and in what order did learners turn for help when it was needed?
- Did learners realize when they needed help?
- Were learners reluctant to or accepting of seeking help?

6. Alignment with Standards

6.1. PA Academic Standards

Geography

7.1.12 Basic Geography Literacy

- Analyze data and issues from a spatial perspective using the appropriate geographic tools.
- Analyze the location of places and regions.

7.2.12 The Physical Characteristics of Places and Regions

- Analyze the physical characteristics of places and regions including the interrelationships among the components of Earth's physical systems.

History

8.1.12 Historical Analysis and Skills Development

- Synthesize and evaluate historical sources.
- Synthesize historical research.

Mathematics

2.5.11 Mathematical Problem Solving and Communication

- Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.

Reading, Writing, Speaking and Listening

1.8.11 Research

- Locate information using appropriate sources and strategies.
- Organize, summarize and present the main ideas from research.

6.2. Assessment Anchors

M8.E.1.1

Choose, display or interpret data (tables, charts, graphs, etc.). Reference: 2.6.5.A, 2.6.8.E, 2.7.8.D, 2.6.3.B

6.3. NETS for Learners 2007:

1. Creativity and Innovation

Learners demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Learners:

a. apply existing knowledge to generate new ideas, products, or processes.

b. create original works as a means of personal or group expression.

c. use models and simulations to explore complex systems and issues.

2. Communication and Collaboration

Learners use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Learners:

a. interact, collaborate, and publish with peers, experts or others employing a variety of digital environments and media.

b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.

c. develop cultural understanding and global awareness by engaging with learners of other cultures.

d. contribute to project teams to produce original works or solve problems.

3. Research and Information Fluency

Learners apply digital tools to gather, evaluate, and use information. Learners:

a. plan strategies to guide inquiry.

b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.

c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.

d. process data and report results.

4. Critical Thinking, Problem-Solving & Decision-Making

Learners use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources. Learners:

b. plan and manage activities to develop a solution or complete a project.

c. collect and analyze data to identify solutions and/or make informed decisions.

5. Digital Citizenship

Learners understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Learners:

a. advocate and practice safe, legal, and responsible use of information and technology.

b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.

c. demonstrate personal responsibility for lifelong learning.

d. exhibit leadership for digital citizenship.

6. Technology Operations and Concepts

Learners demonstrate a sound understanding of technology concepts, systems and operations. Learners:

a. understand and use technology systems.

b. select and use applications effectively and productively.

c. troubleshoot systems and applications.

d. transfer current knowledge to learning of new technologies.

6.4. New Bloom's

Alignment with Bloom's Revised (2001)

- How does this lesson align with Bloom's revised (2001)?
- Does the lesson provide a structure for logical sequential movement through Bloom's revised?
- How does the lesson accommodate for differentiation of learners so that movement through Bloom's revised is experienced appropriately for all learners?
- Did you keep in mind the various levels of Bloom's revised at which different learners could be expected to progress? Did you use this information when forming your groups?

This Lesson Articulated with Bloom's Revised (2001)

Bloom's Revised level	Actions/Products
Creating	plan, produce
Evaluating	investigate, report
Analyzing	organize, attribute, structure, integrate, integrate, report
Applying	interpret, exemplify, infer, paraphrase, classify, explain, illustration, demonstration, presentation
Understanding	summary, collection, explanation, show and tell, example, share information, label, list
Remembering	recognizing, describing, identifying, locating

6.5. 21st Century Skills

The North Central Regional Educational Laboratory (NCREL, 2003) developed a working model that delineates 21st century skills. The model is featured below. Use the model to help you answer the following questions:

- What are the key 21st century skills evident in this lesson?
- Do these skills fit into the lesson transparently, or do they feel "artificial"?
- Is there synergy between 21st century learning skills in this lesson and Bloom's revised? Can you see a connection between the two?
- How does the adoption of 21st century learning skills require a change the learning environment?

(NCREL, 2005)

Alignment with 21st Century Learning Skills

1. Digital-Age Literacy [basic, scientific and technologic literacies; visual and information literacies; global awareness]
2. Effective Communication [teaming, collaboration and interpersonal skills; interactive communication]
3. Inventive Thinking [adaptability, managing complexities, and self-direction; curiosity, creativity; higher-order thinking and sound reasoning]
4. High Productivity [prioritizing, planning and managing; effective use of real-world tools; ability to produce relevant, high quality products]

21st Century Teaching Skills

Teaching and learning are inextricably intertwined. Thus, delivering instruction that promotes 21st century learning requires the recognition and the application of 21st century teaching skills in a way that changes the teaching/learning environment. Below is a table that represents ISTE's (2007) conditions for new learning environments. This lesson met all of the ISTE criteria.

- Go through the chart and see where these criteria are evident in the lesson.
- How does this environment differ from the traditional facilitator-centric classroom?

- What issues does the new learning environment present for the classroom facilitator?
- How do you feel these issues can be best addressed?
- What does this model insinuate for facilitators as a learning community?

This lesson supports the following 21st century teaching skills:

New Learning Environments (ISTE, 2007)	
Learner-centered learning	X
Multisensory stimulation	X
Multipath progression	X
Multimedia	X
Collaborative work	X
Information exchange	X
Active/exploratory/inquiry-based learning	X
Critical thinking and informed decision-making	X
Proactive/planned action	X
Authentic, real-world context	X

7. Documenting (Upload to FTP Site)

8. Q&A

9. Conclusion

Unrelenting change in technology and movement from a mass production economy to an economy of innovation (Freidman, 1990; 2000, 2006; Godbey, 2006; Goldman, Nagel, Preiss, 1995; Preiss, Goldman, & Nagel, 1996) has caused education to reexamine learning environments and processes, and grapple with synthesizing new technologies into the learning environment (e.g.,Chickering & Gamson, 1999; Magolda, 1992; Pascarella & Terenzini, 1998). Social constructivist and socio-cultural theories and perspectives (i.e., Vygotsky and Brunner), social cognitive theory (i.e., Bandura) as well as theories of situated cognition have all contributed to reshaping and enhancing the learning environment supported by the use of technology (Koschmann, 1996). These approaches involve movement from traditional facilitator-centered pedagogies to a social-constructivist

paradigm where learners are encouraged to work both individually and collaboratively to solve relevant problems or produce viable solutions through authentic learning activities (Huang, 2002) in both face-to-face classrooms and online environments (American Psychological Association, 2002; ISTE, 2007; NCREL, 2005). These theories are based on the assumption that knowledge is situated in the activity, context, and culture in which it is developed and used (Brown, Collins, & Duguid, 1989).

Project-based learning is an approach that is consonant with the socio-cultural theory and situated cognition (Kozulin, Gindis, Ageyev & Miller, 2003). A project-based learning approach provides opportunities for learners to work with authentic tasks that they address in a natural social context. The creation of relatively small working groups of learners provides an arena in which they pool knowledge and theories to achieve the group's goals by thinking aloud, offering perspectives, changing perspectives, and collaboratively building knowledge through opportunities for experimentation, self-correction and reflection (Pooell, Van der Krogt, & Wildemeersch, 1998). Seidel et al. (2002) noted that project-based learning is characterized by learner involvement in a series of activities or procedures that require sustained focus over time and that are ultimately linked to a creation of significance such as a performance-based outcome, a product, or a service that is highly valued by the learner and/or broader community. This type of effort generally requires that the learners become involved in activities that involve the community for research, internships, presentations or other relevant activities.

Underlying components of project-based learning include: a) engagement, b) authenticity, c) knowledge generation, d) collaboration, d) academic reinforcement and e) ongoing assessment (Seidel, Aryeh, & Steinberg, 2002). Project-based learning is consistent with ISTE's (2007) guidelines for 21st century teaching skills, NCREL's (2005) delineation of 21st century skills to be taught, and with the National Education Technology Standards (NETS) for learner learning.

This project clearly focuses on all of the relevant aspects of the current standard sets as well as focusing on the *The Bridge to the 21st Century Learning* as established in the *Learning for the 21st Century* report and *MILE Guide for 21st Century Skills* which is based on six key elements of 21st century learning:

1. Emphasize core subjects
2. Emphasize learning skills
3. Use 21st century tools to develop learning skills

4. Teach and learn in a 21st century context
5. Teach and learn 21st century content
6. Use 21st century assessments that measure 21st century skills.

This lesson presents an exemplary model for 21st century teaching and learning. The framework of this lesson provides a working template with criteria for formulating, planning, and implementing lessons consonant with a 21st century model of teaching and learning.

ISTE NETS states:

> The most effective learning environments meld traditional approaches and new approaches to facilitate learning of relevant content while addressing individual needs. The resulting learning environments should prepare students to:
>
> - Communicate using a variety of media and formats
> - Access and exchange information in a variety of ways
> - Compile, organize, analyze, and synthesize information
> - Draw conclusions and make generalizations based on information gathered
> - Know content and be able to locate additional information as needed
> - Become self-directed learners
> - Collaborate and cooperate in team efforts
> - Interact with others in ethical and appropriate ways

Meeting all of the above criteria, this lesson presents an exemplary model for 21st century teaching and learning. The framework of this lesson provides a working template with criteria for formulating, planning, and implementing lessons consonant with a 21st century model of teaching and learning.

An Expedition Using Google Earth
Learner Handout

Your team will plan a one-week "vacation" of your choice either in your state or within the United States, starting from your home town. The outcomes will be a set of technology-based project pieces that document your team's journey, highlighted by a multimedia tour of your journey developed in *Google Earth*.

Project Tasks

- Determine team member jobs
- Plan your destination, route and timeline
- Decide on transportation (your own car, rent a car, rent a motor home or fly, then rent a car)
- Go online to explore and learn about sights and places along the way
- Collect the textual information and images of sights and places along your route
- Determine estimated daily expenses and trip totals

Project Outcomes

- A printed map showing the chosen route with stops, sights, etc. (a planning tool)
- A sharable *Google Earth* file so others can access and see your journey
- An *Excel* spreadsheet documenting your trip expenses

Extensions

- A blog documenting the journey
- A *PowerPoint* presentation using screen captures from the *Google Earth* file

Trip Requirements

- Visit at least two places of historical and/or cultural significance
- Stay in no place for more than three consecutive days
- Include at least one image for each day of your trip
- Include at least one Placemark for each day on your trip

After determining your route and charting it on a paper map, which you turn in to your teacher for approval, you need images and information about your trip and destinations. Use Yahoo and/or Google and type in keywords for places you will visit. To get images, make sure to use the image search option of Yahoo and Google.

Staying Organized

Create a folder on your computer into which you will save all files. Other options may include saving onto the school's network drive or onto a flash drive/thumb drive for portability.

When you save files give them descriptive names. For example: If you are traveling to Disneyland, you want to find a Disney image online. When you find it, and try to save it, it may just be called "image". You do not want to use this default name because it is not descriptive. So, you would name the file *disneysign* or something similar so you know exactly what it is. When you save *Word* files (the textual descriptions of places you visit), make sure you also use descriptive names, thus avoiding confusion as you start to develop your tour.

Hint and Tips

To save an image from the Web: Right-click on the image. On the next menu, choose Save Picture As. You then need to give it a descriptive name as explained previously and save it to the folder you have created for this project. Make sure to save it as a JPG file.

Launch *Microsoft Word 2007*. Task-switch between the Web browser and *Word* by holding down the ALT key and pressing ESCAPE or by selecting the desired application in the Quick Launch toolbar at the bottom of the screen.

Copy and paste useful information from the Internet into the *Word* document to use in preparing the text for your Placemarks. Highlight pertinent information on a Web page, then choose EDIT → COPY. Return to the *Word* document and place the cursor where you want the information to appear. Then, at the top left of your *Word* window, choose PASTE. Notice the PASTE OPTIONS Smart Tag that appears just below the pasted section. Click the button and note the available options.

Note: *Please cite all sources when copying and pasting information.*

Project Web Sites

Google Earth: http://earth.google.com/

Basics of Google Earth: http://earth.google.com/tour/

MapQuest: To find and print your route map for planning: http://www.mapquest.com

Expedia: For airline, car rental and hotel info: http://www.expedia.com

Gas Price estimates: http://www.gasbuddy.com/

Online Image Storage: http://www.panoramio.com

Sample Google Earth Tours

Seven Wonders of the World: http://www.googletouring.com/t.php?id=168

Mountains of Fire: http://www.googletouring.com/t.php?id=5

Famous Golf Courses: http://www.googletouring.com/t.php?id=9

Related Resources

Google Earth Tour Project Guide: Get this from your facilitator

Google Earth User's Guide: http://earth.google.com/userguide/v4/

Google Earth Tutorials: http://earth.google.com/outreach/tutorials.html

Podcast-Creating Placemarks: http://cdn.libsyn.com/kokae/goo_earth_3.mp4

YouTube Video-Adding Placemarks: http://youtube.com/watch?v=P82QGf0fP9E