SECTION 1

Technology Integration Lessons

Overview of Lesson Plans

Language Arts
-Technology Integration Ideas
-Sample Lesson Plans

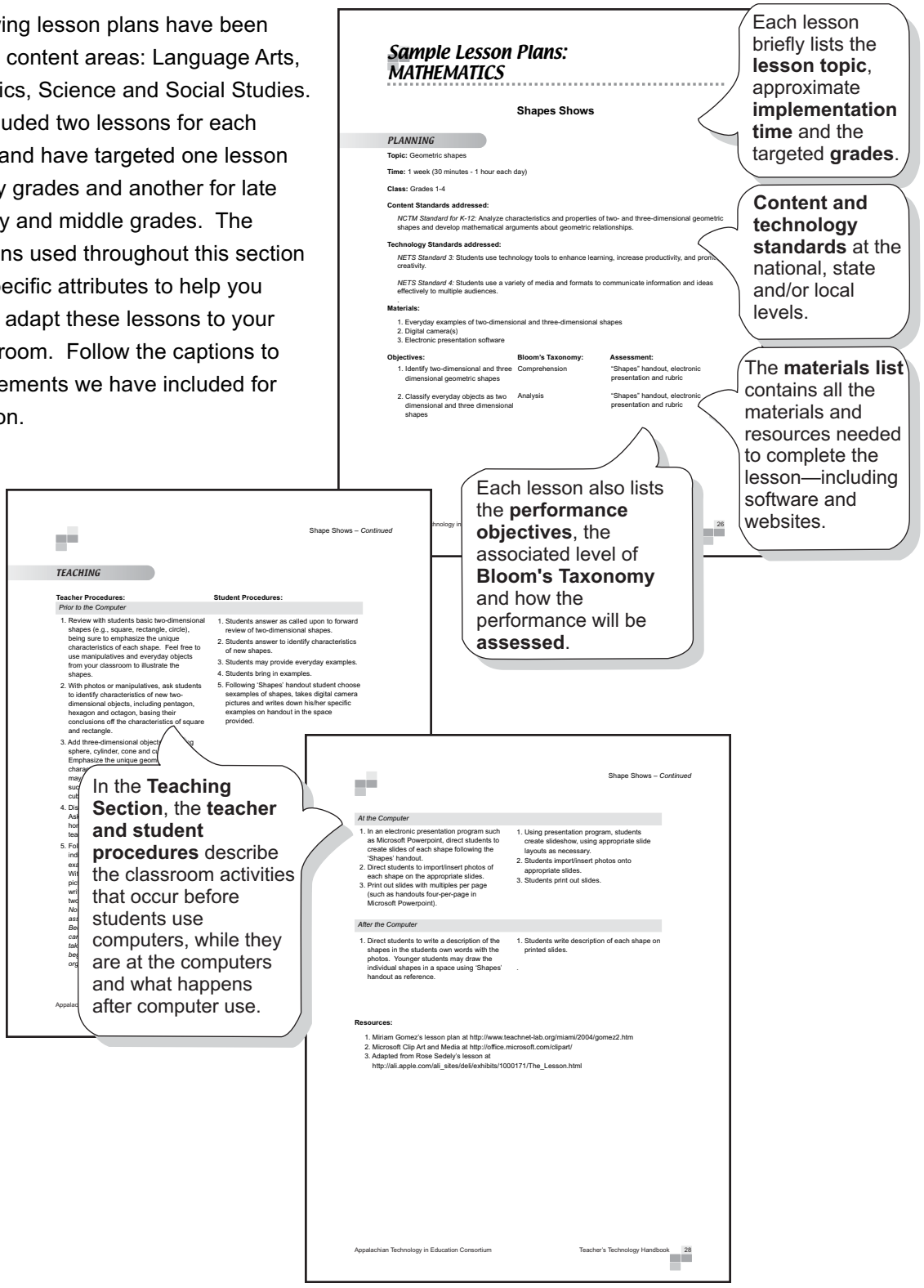
Mathematics
-Technology Integration Ideas
-Sample Lesson Plans

Science
-Technology Integration Ideas
-Sample Lesson Plans

Social Studies
-Technology Integration Ideas
-Sample Lesson Plans

Overview of Lesson Plans

The following lesson plans have been divided by content areas: Language Arts, Mathematics, Science and Social Studies. We've included two lessons for each discipline and have targeted one lesson for primary grades and another for late elementary and middle grades. The lesson plans used throughout this section contain specific attributes to help you adopt and adapt these lessons to your own classroom. Follow the captions to see the elements we have included for each lesson.



Sample Lesson Plans: MATHEMATICS

Shapes Shows

PLANNING

Topic: Geometric shapes

Time: 1 week (30 minutes - 1 hour each day)

Class: Grades 1-4

Content Standards addressed:

NCTM Standard for K-12: Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Technology Standards addressed:

NETS Standard 3: Students use technology tools to enhance learning, increase productivity, and promo creativity.

NETS Standard 4: Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Materials:

1. Everyday examples of two-dimensional and three-dimensional shapes
2. Digital camera(s)
3. Electronic presentation software

Objectives:	Bloom's Taxonomy:	Assessment:
1. Identify two-dimensional and three dimensional geometric shapes	Comprehension	"Shapes" handout, electronic presentation and rubric
2. Classify everyday objects as two dimensional and three dimensional shapes	Analysis	"Shapes" handout, electronic presentation and rubric

Shape Shows – *Continued*

TEACHING

Teacher Procedures:	Student Procedures:
Prior to the Computer	
1. Review with students basic two-dimensional shapes (e.g., square, rectangle, circle), being sure to emphasize the unique characteristics of each shape. Feel free to use manipulatives and everyday objects from your classroom to illustrate the shapes.	1. Students answer as called upon to forward review of two-dimensional shapes.
2. With photos or manipulatives, ask students to identify characteristics of new two-dimensional objects, including pentagon, hexagon and octagon, basing their conclusions off the characteristics of square and rectangle.	2. Students answer to identify characteristics of new shapes.
3. Add three-dimensional objects	3. Students may provide everyday examples.
	4. Students bring in examples.
	5. Following 'Shapes' handout student choose sexamples of shapes, takes digital camera pictures and writes down his/her specific examples on handout in the space provided.

Shape Shows – *Continued*

At the Computer	
1. In an electronic presentation program such as Microsoft Powerpoint, direct students to create slides of each shape following the 'Shapes' handout.	1. Using presentation program, students create slideshow, using appropriate slide layouts as necessary.
2. Direct students to import/insert photos of each shape on the appropriate slides.	2. Students import/insert photos onto appropriate slides.
3. Print out slides with multiples per page (such as handouts four-per-page in Microsoft Powerpoint).	3. Students print out slides.
After the Computer	
1. Direct students to write a description of the shapes in the students own words with the photos. Younger students may draw the individual shapes in a space using 'Shapes' handout as reference.	1. Students write description of each shape on printed slides.

Resources:

1. Miriam Gomez's lesson plan at http://www.teachnet-lab.org/miami/2004/gomez2.htm
2. Microsoft Clip Art and Media at http://office.microsoft.com/clipart/
3. Adapted from Rose Sedely's lesson at http://ali.apple.com/ali_sites/deli/exhibits/1000171/The_Lesson.html

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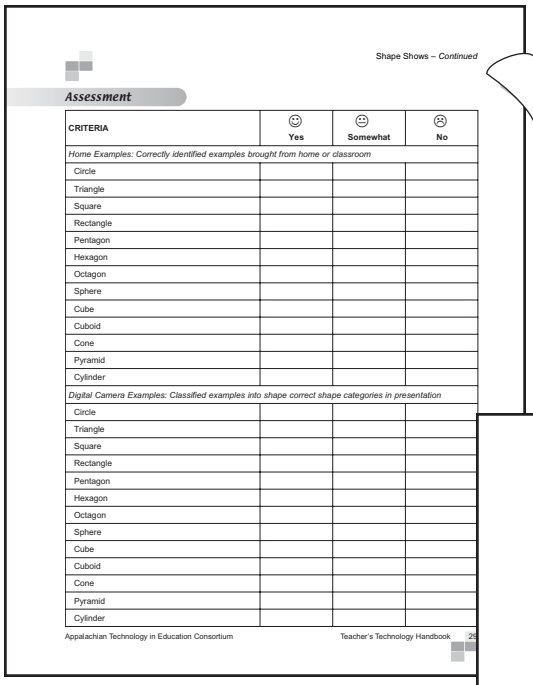
Each lesson briefly lists the **lesson topic**, approximate **implementation time** and the targeted **grades**.

Content and technology standards at the national, state and/or local levels.

The **materials list** contains all the materials and resources needed to complete the lesson—including software and websites.

Each lesson also lists the **performance objectives**, the associated level of **Bloom's Taxonomy** and how the performance will be **assessed**.

In the **Teaching Section**, the **teacher and student procedures** describe the classroom activities that occur before students use computers, while they are at the computers and what happens after computer use.



Shape Shows – *Continued*

Assessment

CRITERIA	☺ Yes	😐 Somewhat	☹ No
Home Examples: Correctly identified examples brought from home or classroom			
Circle			
Triangle			
Square			
Rectangle			
Pentagon			
Hexagon			
Octagon			
Sphere			
Cube			
Cuboid			
Cone			
Pyramid			
Cylinder			
Digital Camera Examples: Classified examples into shape correct shape categories in presentation			
Circle			
Triangle			
Square			
Rectangle			
Pentagon			
Hexagon			
Octagon			
Sphere			
Cube			
Cuboid			
Cone			
Pyramid			
Cylinder			

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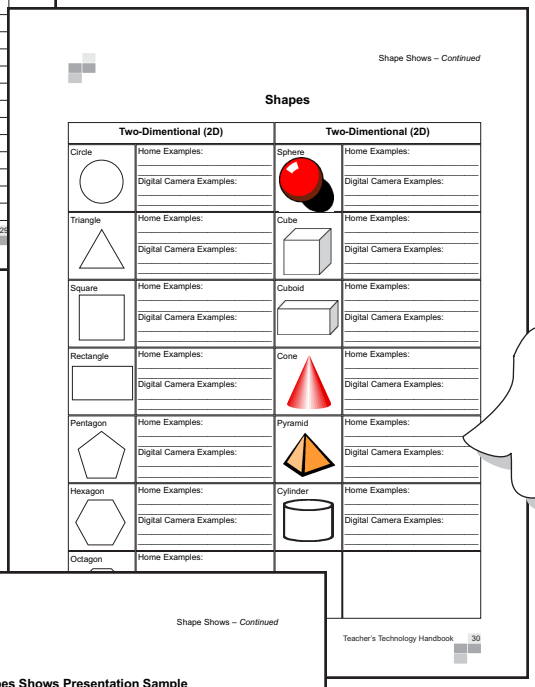
Assessment rubrics are aligned with performance objectives.



Shape Shows – *Continued*

Shapes

Two-Dimentional (2D)		Two-Dimentional (2D)	
Circle	Home Examples: Digital Camera Examples:	Sphere	Home Examples: Digital Camera Examples:
Triangle	Home Examples: Digital Camera Examples:	Cube	Home Examples: Digital Camera Examples:
Square	Home Examples: Digital Camera Examples:	Cuboid	Home Examples: Digital Camera Examples:
Rectangle	Home Examples: Digital Camera Examples:	Cone	Home Examples: Digital Camera Examples:
Pentagon	Home Examples: Digital Camera Examples:	Pyramid	Home Examples: Digital Camera Examples:
Hexagon	Home Examples: Digital Camera Examples:	Cylinder	Home Examples: Digital Camera Examples:
Octagon	Home Examples:		

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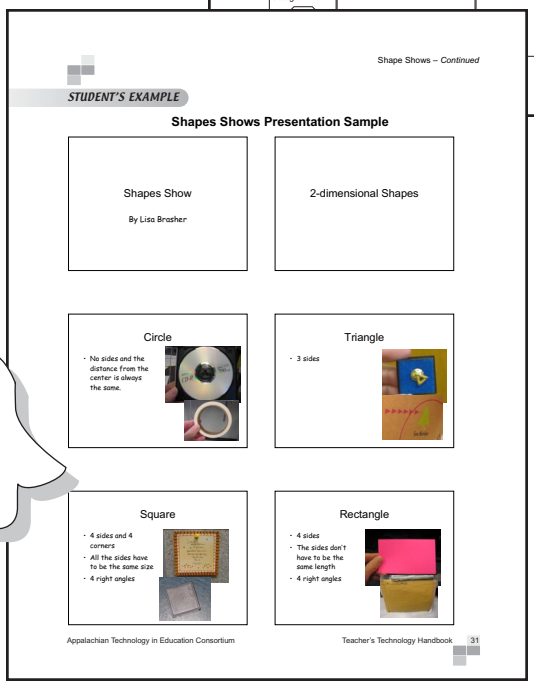
Ready-to-copy **handouts** as blackline masters.



Shape Shows – *Continued*

STUDENT'S EXAMPLE

Shapes Shows Presentation Sample

Shapes Show

By Lisa Brasher

2-dimensional Shapes

Circle

- No sides and the distance from the center is always the same.

Triangle

- 3 sides

Square

- 4 sides and 4 corners
- All the sides have to be the same size
- 4 right angles

Rectangle

- 4 sides
- The sides don't have to be the same length
- 4 right angles

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The final component included in each lesson is examples of **student products.**

Technology Integration Ideas: LANGUAGE ARTS

Below are examples of activities and tools for teachers to integrate technology in the Language Arts area. Also included are the approprate national standards for each activity from Standards for the English Language Arts, p. 24, Copyright 1996 by the International Reading Association and National Council of Teachers of English.

Activities	Tools	Sample National Content Area Standards
Create "vocabulary word" table that included a graphic for each word and a description of why it represents the word.	Word processing	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.
Download a CNN editorial and replace the adjectives with ones that have a similar meaning.	Word processing	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.
Rewrite the Bill of Rights to a level that is more easily understood by 2nd grade students	Word processing	Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
Download a picture of the State of Liberty and create a list of 50words that describe its features.	Word processing	Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).
Locate clipart of two birds that are very different, and then write a paragraph that highlights those differences.	Word processing	Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).
Use weather data from the Internet to create the "Window on Weatherr" section of the school newspaper.	Word processing	Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).
Compose a letter to the Mayor regarding the poor air quality of your neighborhood. Include digital photos to support your argument.	Word processing	Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).
Write a one page story that predicts what life in the United States will be like in 75 years.	Word processing	Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

Activities	Tools	Sample National Content Area Standards
Use the "Track Changes" tool to suggest edits on your partner's report.	Word processing	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.
Use a different color text to add your part of a "chain" story written by students in your group.	Word processing	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.
Choose three graphics that represents key features of the main character in today's story and describe why you chose each one.	Word processing	Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).
Use the "Highlight" tool to mark each noun yellow and each verb blue.	Word processing	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.
Lower the reading level of the 1st paragraph of Abraham Lincoln's presidential acceptance speech by using different adjectives and adverbs.	Word processing	Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
Compare the number of adjectives and adverbs used in the first 300 words of a non-fiction book and a fiction book.	Spreadsheets	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.
Similarities of fairy tales, e.g., setting, theme, characters.	Databases	Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.
Parts of speech examples.	Databases	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.

Activities	Tools	Sample National Content Area Standards
Plot Main Ideas: Punctuation	Concept Maps	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.
Graphically depict pars of speech	Presentations	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.
Illustrate prepositions in action	Presentations	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.
Books on the Web e.g., Complete Works of Shakespeare	Web Browsers	Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, and video) to gather and synthesize information and to create and communicate knowledge.
Audio - e.g., Robert Frost reading poetry	Web Browsers	Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, and video) to gather and synthesize information and to create and communicate knowledge.
Internet News	Web Browsers	Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, and video) to gather and synthesize information and to create and communicate knowledge.
Human interest stories	Web Browsers	Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, and video) to gather and synthesize information and to create and communicate knowledge.
Online Dictionaries or Thesaurus	Web Browsers	Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, and video) to gather and synthesize information and to create and communicate knowledge.

Activities	Tools	Sample National Content Area Standards
Communicate with other students	Communication Tools	Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, and graphics).
Communicate with writers	Communication Tools	Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, and graphics).

Sample Lesson Plans: LANGUAGE ARTS

Quick as a Cricket

PLANNING

Topic: Figurative Language/Similies

Time: 30 minutes

Class: 2nd Grade Language Arts

Content Standards addressed:

MSC Standard 2—Students should be able to derive literal, implied, and personal meaning from different kinds of texts and presentations (literary, informative, and technical). (2) Demonstrate understanding of oral and printed texts and presentations by interpreting the impact of the author's and speaker's decisions (such as form, content, style, rhetoric, voice, vocabulary, and literary devices).

TN State Standard 3.1.13—Experience various literary and media genres. (i) Explore the ways in which language is used in literary texts (e.g., rhythm, beat, imagery, simile, and metaphor).

Technology Standards addressed:

MCS Technology Standard 3—Students use technology productivity tools to collaboratively construct completed products that represent quality work.

MCS Technology Standard 5—Use a variety of media and technology resources for teacher directed and independent tasks

Materials:

1. *Quick As a Cricket* by A. Woods
2. Storyboard forms
3. Colors, markers

Objectives:	Bloom's Taxonomy:	Assessment:
1. Define similie	Knowledge	Write the definition of a similie
2. Recognize similes in print	Application	Select similes from print
3. Create similes in their personal writings	Application/Synthesis	Create simile story
4. Create a multimedia simile story	Application/Synthesis	Create simile presentation using Powerpoint/Multimedia tools

TEACHING

Introduction:

Turn to your neighbor. Everyone smile at each other. Look carefully. If you compare your neighbor to an animal, what animal does s/he look like?
What makes you say that? (Allow several students to respond) You have just made a comparison of your friend to an animal. In literature, that comparison has a special name and that is what we are going to learn about today.

Teacher Procedures:	**Student Procedures:**
Introduction	
1.Reads the story *Quick as a Cricket*. Asks what do students notice about all of the sentences. Arrive at: They follow the formula …_____ as a _____.	1. Actively listen and interact with teacher.
2.Connects sentence to the word “simile”	
3.Defines simile—making a comparison using like or as	2. Repeat the definition chorally and individually.
Model	
1. Gives several examples of similes using “as” a. As sleepy as a kitten b. As fussy as a baby c. As sleek as a fast car d. As dirty as mud	1. Listen and read along
2. Rereads part or all of story	2. Name recognized similes from story
Guided Practice	
1. Encourages class to come up with other comparisons 2. Writes student similes on board	1. Orally students create other similes
Prior to the Computer	
1. Distribute Planning Sheets and Storyboards. 2. Direct students to complete planning sheets and storyboards to create their own simile story with a slide show. Be sure to include Title slide.	1. At desk, complete Planning Sheet and Storyboards for simile story.

At the Computer	
1. Direct and assist students with creating slide show from storyboards.	1. Use storyboards to create slide show. Type simile sentences as written on storyboards. 2. Use clip art to enhance slide and reflect simile.
After the Computer	
1. Direct students to read story to a peer and to the teacher. 2. Have students complete Reflection Sheet about the activity.	1. Read story to peer. 2. Read story to teacher 3. Complete Reflection Sheet.

Resources:

1. *Quick as a Cricket* by A. Wood
2. Dr. Deborah Lowther's planning sheets, storyboards and reflection sheets.
3. Dr. Susan Thompson's course lessons

ASSESSMENT

Similes Presentation			
CRITERIA	☺	😐	☹
Story	Well organized story		Not organized
Similes	Follows similes form.		Does not follow similes
Slide show	There are a title slide and more five slides in the presentation.	There is a title slide and three or four slides in the presentation.	There is no slide in the presentation.
Multimedia	Using clipart in every slide.	Using clipart in several slides.	No clipart.
Spelling	One or fewer errors in spelling.	Two or three errors in spelling.	Four errors in spelling.
Capitals & periods	All sentences start with a capital letter and end with a period.	One or two sentences do not start with a capital letter or end with a period.	Do not use capital letters and periods.

Student Name: _____

Lessons Learned: Reflecting on My Multimedia

Title of Slides/Stack: _____

Please complete the following:

1. What do you like the most about your stack?_____

_____

_____

2. How would you change your stack? _____

_____

_____

3. What did you learn from creating this stack? Please do not list what you learned about HyperStudio or Powerpoint, but what you learned about your school subjects, such as math, reading, wiritng, etc.

_____

_____

_____

_____

_____

4. Was it helpful to create a multimedia presentation for this lesson? Please explain your answer.

_____

_____

_____

_____

Peer Reviewer Name: _____

Multimedia Field Test Report

Title of Slides/Stack: _____

Author: _____

Please √ off each card as you evaluate it and provide comments when appropriate

Card # √	Comments
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	

Best Feature(s) of this multimedia: _____

_____

Things that might improve this multimedia: _____

_____

Date Completed: _____ Comments: _____

_____

Student Name: _____ Grade Level: _____

Multimedia Planning Sheet

Direction:

Complete this information before you develop your multimedia:

Title of Slide/Stack: _____

Purpose of Slides/Stack: _____

_____

Grade Level: _____

Resources needed to make this project:

Information Sources: _____

_____

_____

Graphics: _____ _____

_____

_____

3. What did you learn from creating this stack? Please do not list what you learned about HyperStudio or Powerpoint, but what you learned about your school subjects, such as math, reading, wiritng, etc.

_____

_____

Audio: _____

_____

_____

Notes: _____

_____

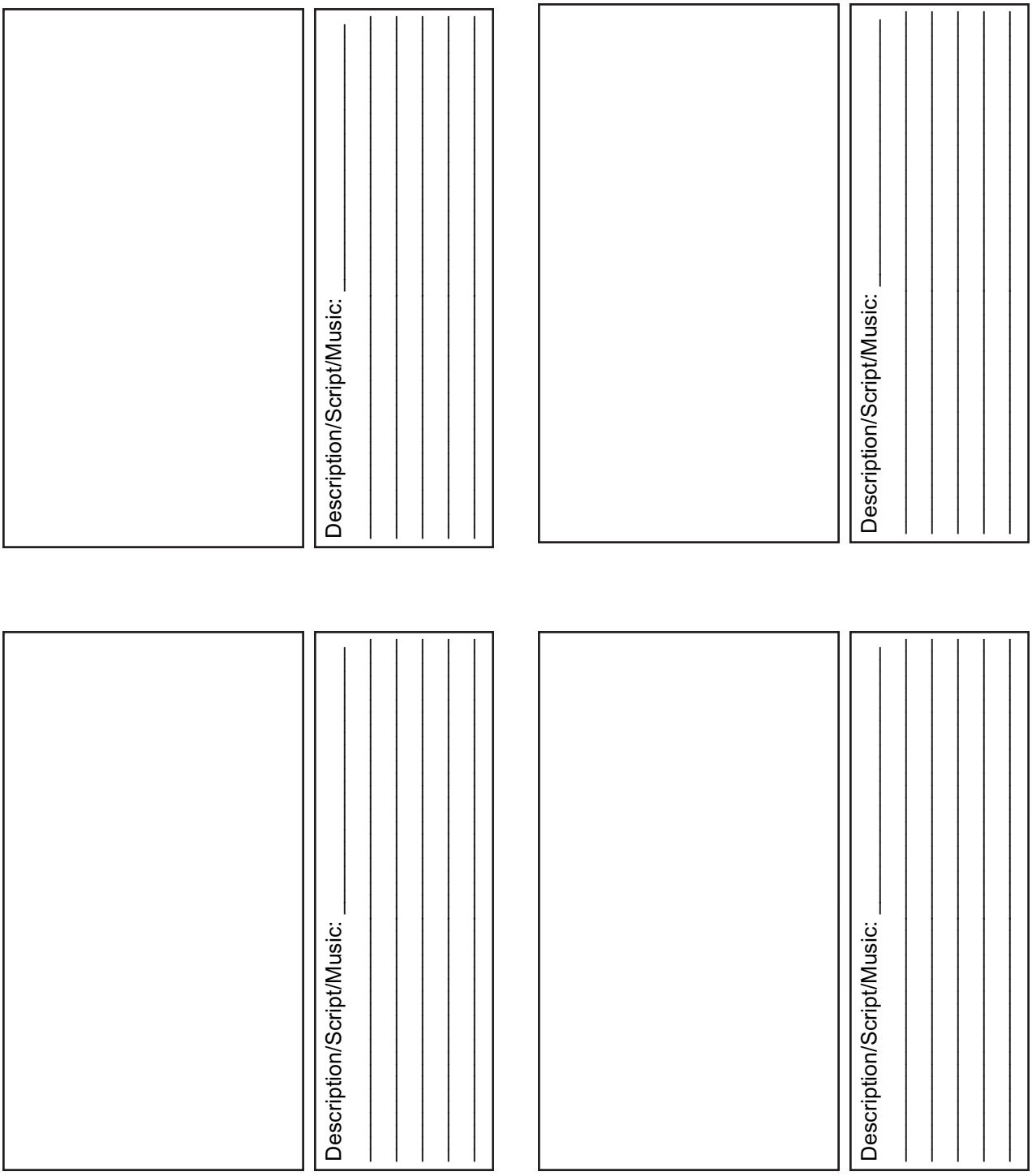
_____

_____

_____

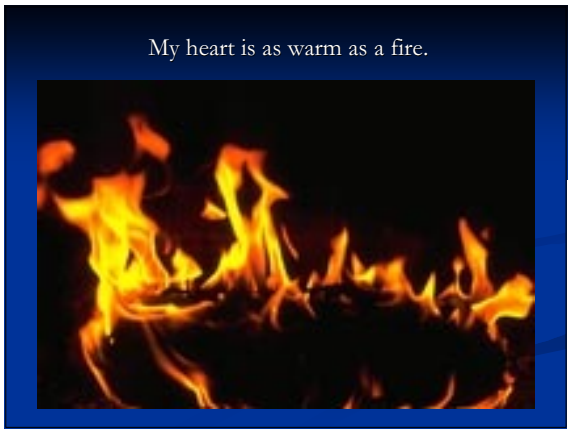
Storyboards

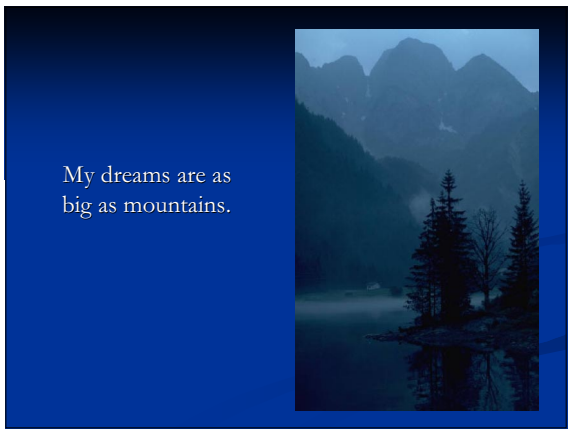
Include in description any clip art ideas, sounds or transitions you want

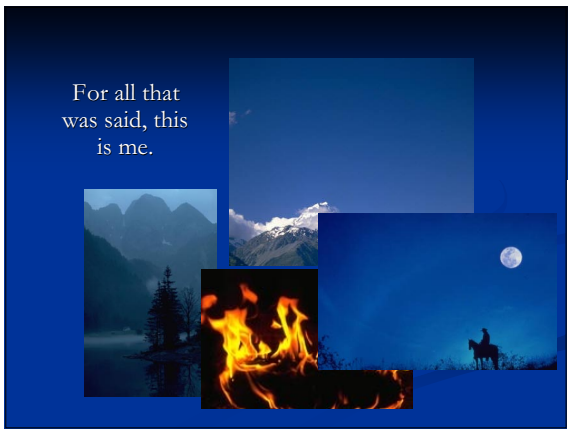


STUDENT'S EXAMPLE

Simlies Presentation Sample







Sample Lesson Plans: LANGUAGE ARTS

Idea Investigations for Short Stories

PLANNING

Topic: Language Arts

Time: 45 minutes for 2 days

Class: Grade 5-8

Content Standards addressed:

The Standards of Learning for Virginia Public Schools
Writing
6.6 The student will write narratives, descriptions, and explanations.
a) Use a variety of planning strategies to generate and organize ideas.
b) Select vocabulary and information to enhance the central idea, tone, and voice.
Located at: http://www.pen.k12.va.us/VDOE/Superintendent/Sols/home.shtml

Technology Standards addressed:

Standard 3: Technology productivity tools: Students use technology productivity tools to collaboratively construct completed products that represent quality work.

Materials:

1. Idea Investigations for Short Stories Planning Sheet
2. Digital Camera(s)
3. Computer
4. Microsoft Word

Objectives:	Bloom's Taxonomy:	Assessment:
1. TLW use a digital camera to capture images appropriate to be used as the basis for a short fictional story.	Comprehension, application	Idea Investigations for Short Stories Rubric
2. TLW use an outline generate and organize ideas for a short fictional story.	Knowledge, comprehension, analysis	Idea Investigations for Short Stories Rubric
3. TLW select vocabulary and information to enhance the central idea, tone, and voice of a short fictional story.	Synthesis	Idea Investigations for Short Stories Rubric

TEACHING

Introduction:

- Begin the lesson with a brief discussion of fictional stories and generate a list of themes and key ideas in favorite stories.
- Share with students that today they are going to be "Idea Investigators" who are charged with the following task: Capture four unique and interesting objects or scenes that will serve as the key ideas to create short stories. Each photo is to represent a separate idea rather than a series of linked concepts.
- The students will then be given a photo from each group and asked to individually write an outline from which they will create a short fictional story based on the objects in the four photos.

Prior to the Computer

1. After the Introduction, place students into groups of four.
2. Distribute digital cameras to each group, or plan a rotation schedule if only one camera is available (students should be familiar with camera use).
3. Have groups compete the Idea Investigations for Short Stories Planning Sheet and plan where students can go to take photos.

1. Student groups complete their Idea Investigations for Short Stories Planning Sheet by briefly describing possible photos they may take.
2. Groups go on their "Idea Investigation" to take photographs, letting each student focus on one area. Students should take several pictures of the each subject.
3. Students download their four photos onto the Teacher Workstation Computer.

At the Computer

1. Randomly distribute the photos ensuring that each group has one photo from the four groups.
2. Direct the computer monitor from each group to bring a disk to the Teacher Workstation Computer and download his/her group's assigned photos.
3. Direct each student to load the photos in his/her folder.
4. Monitor and assist as needed

1. The Group's computer monitor copies their group's photos onto a disk.
2. The computer monitor then has the four group members copy the photos to his/her personal file.
3. Each student opens MS Word and inserts the four photos into a document.
4. Each student uses the photos as a basis for writing an outline of a short story.
5. Students use outline to write the story.
6. When the story is finished, students correct any errors and print a copy.

After the Computer

1. Place students in their groups and ask them to pass their story to the person on the right and quietly read the story.
2. Continue the process until students have read all the stories in the group.
3. Give students 5 to 10 minutes to select the story they enjoyed the most.
4. Have the students whose stories were selected read them to the class.
5. Discuss how each story was different and how writing is a way for individuals to express their creativity.

1. While in their group, have students exchange papers and read each of the four stories.
2. They collectively select one to share with the class. .
3. Students engage in class discussion about the creative nature of writing.

ASSESSMENT

IDEA INVESTIGATION FOR SHORT STORIES RUBRIC				
CRITERIA	**1**	**2**	**3**	**4**
TLW use a digital camera to capture images appropriate to be used as the basis for a short fictional story.	Very few or none of the digital images represent ideas that could appropriately serve as the basis for a short story..	Only a few of the digital images clearly or somewhat clearly represent ideas that could appropriately serve as the basis for a short story.	Almost all of the digital images clearly represent ideas that could appropriately serve as the basis for a short story.	All of the digital images very clearly represent ideas that could appropriately serve as the basis for a short story.
TLW use an outline to generate and organize ideas for a short fictional story.	The outline provides no or very limited organization to the story ideas. It is not presented in a logical or supported manner.	The outline somewhat organizes the story ideas in a fairly logical manner that provides limited support.	The outline clearly organizes the story ideas in a logical and supported manner.	The outline very clearly organizes the story ideas in a logical and well-supported manner.
TLW select vocabulary and information to enhance the central idea, tone, and voice of a short fictional story.	The story is poorly written and uses vocabulary and information that limits the central idea, tone, and voice of the story.	The story is moderately written and somewhat uses vocabulary and information that enhances the central idea, tone, and voice of the story.	The story is well-written and uses vocabulary and information that enhances the central idea, tone, and voice of the story.	The story is very well-written and expertly uses vocabulary and information that enhances the central idea, tone, and voice of the story.

Idea Investigations for Short Stories Template

Group Members:
1.
2.
3.
4.

Brainstorm topics, subjects, and/or objects for photos that would provide good “Ideas” for writing short stories:

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.

STUDENT'S EXAMPLE

Idea Investigations for Short Stories
Outline

Dan the Fan

a. Dan is a fan of:

i. Baseball

ii. His shiny red monster truck

iii. Maria – a smart girl in his neighborhood

b. Dan wants to impress Maria

i. Asks her to a playoff baseball game

ii. Brings her flowers before they go to the game

iii. Takes her to the game in his truck

c. a surprise ending

i. the homerun baseball

Dan the Fan

By Stephanie Good Performer

Dan Group 2 – Photo 3	**Dan's Shiny Red Monster Truck** Group 1 – Photo 1
	
Flowers For Maria Group 4 – Photo 2	**Homerun Baseball** Group 3 – Photo 4
	

The Story ~

Dan's a friendly kind of guy that always has a smile on his face – especially when he is thinking about baseball or his shiny red monster truck. In fact, he is the biggest fan of baseball in his entire neighborhood. Dan goes to every single game, wears the team jacket, and has baseball posters all over his room – or at least over half of his room. The other half is covered with monster trucks, which are all red. So, I guess you could say that Dan was not only a huge fan of baseball, but also a fan of shiny red monster trucks. That was all he thought about – until he saw Maria.

It happened on a bright sunny day when Maria was walking to the library and Dan was waiting at a stoplight on his way to a baseball game. She turned her head and looked directly at Dan with her big brown eyes. Immediately, his heart jumped inside his chest, as she was the most beautiful girl he had ever seen. Yet, Dan was completely surprised that he had even looked at a girl – he loved baseball and trucks – not females! While at the baseball game, thoughts of Maria kept crossing his mind – even in the last inning. What was he going to do now! How can he really like baseball, trucks, and now a girl?? Especially since he did not know who she was or where she lived.

The next morning, Dan decided to relieve his thoughts of Maria by washing his shiny red monster truck. As he was polishing the chrome rims, he suddenly saw Maria's face in the reflection. She was standing right behind him. Once again, his heart nearly jumped out of his chest. He slowly turned around and she said, "Hi, I'm Maria. We saw each other yesterday when I was going to the library." Dan nervously looked away from her pretty face and started polishing the wheels as he said, "I'm Dan." He was to shy to say anything else. Maria, who had been doing her morning run, continued, "I love your truck! In fact, I recognized you because I remembered your truck. This is my favorite model!" Dan stopped polishing and turned to once again look at the beautiful girl who actually liked monster trucks. Before Dan could say anything, Maria noticed the logo of his baseball team on the back window and asked if he was a fan. By now, Dan is in shock and replied, "Yeah, I am one of their biggest fans. I never miss a game and have all their posters in my room. My greatest dream is catch a homerun ball." Maria quickly replied, "That is amazing, I thought I was their biggest fan! But, I've only seen one game." With a big smile, Dan responded, "Games are for fans – why don't you come with me to the next game. It's a playoff against their biggest contender." So started Dan's switch to being a fan of baseball, trucks, and now Maria.

Dan really wanted to impress Maria, so, he tried to look his best and brought her some bright, fresh flowers. These seemed to do the trick as Maria flashed a big smile and looked happily at Dan with her big brown eyes when she greeted him at the door. They happily climbed into his big red monster truck and headed for the game. Both chattered nonstop about the team and the upcoming playoff game. When there, they ate hot dogs, drank sodas, and yelled a lot. Dan couldn't believe how great the day was going. During the last inning, the bases were loaded, Dan's favorite player was up and hit the ball directly toward Dan. The world was moving in slow motion as the ball drew closer and closer. Dan's heart was once again beating out of his chest. Closer and closer, his arms stretched nearly out of their sockets, striving to get the ball, especially with Maria's big brown eyes watching every move. Unexpectedly, next to his hands, were two petite hands into which the coveted ball slammed. Maria clasped the magnificent catch closely to her face and kissed the ball as she exclaimed, "I got it! I got it! I got it!" Dan's heart sunk. As he looked at Maria dancing happily, her brown eyes no longer looked lovely – he saw her as the one who kept him from his greatest dream. Thus, for now, Dan decided that he was happy just being a true fan of baseball and red, shiny monster trucks.

Technology Integration Ideas: MATHEMATICS

Below are examples of activities and tools for teachers to integrate technology in the Mathematics area. Also included are the approprate national standards for each activity from Principles and Standards for School Mathematics: Discussion Draft, Copyright October 1998, by the National Council of Teachers of Mathematics.

Activities	Tools	Sample National Content Area Standards
Plot average yearly precipitation in your county for the past 50 years.	Spreadsheets	Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students interpret data using methods of exploratory data analysis.
Compare miles traveled during migration for 10 different birds.	Spreadsheets	Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students interpret data using methods of exploratory data analysis.
Compare the number of U.S. vs. Asian yearly earthquake occurrences for the past 50 years.	Spreadsheets	Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students interpret data using methods of exploratory data analysis.
Compare grams of sugar in breakfast cereals.	Spreadsheets	Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students interpret data using methods of exploratory data analysis.
Calculate the maximum price per square yard that could be paid, if PTA gave your class $300 to carpet your classroom.	Spreadsheets	Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students develop a disposition to formulate, represent, abstract, and generalize in situations within and outside mathematics.
Determine the shortest driving route from New York City to San Antonio, Texas.	Spreadsheets	Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students build new mathematical knowledge through their work with problems.
Determine the number of trucks needed to transport soil removed for a competition-sized swimming pool.	Spreadsheets	Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students develop a disposition to formulate, represent, abstract, and generalize in situations within and outside mathematics.
Create a budget that would result in at least $100 profit from selling hot dogs at $1.00 each.	Spreadsheets	Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students develop a disposition to formulate, represent, abstract, and generalize in situations within and outside mathematics.

Activities	Tools	Sample National Content Area Standards
Graph the cost differences between using natural gas vs. electricity for heating a home.	Spreadsheets	Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students interpret data using methods of exploratory data analysis.
Use data to demonstrate whether or not the environmental protection efforts are working.	Spreadsheets	Mathematics instructional programs should focus on learning to reason and construct proofs as part of understanding mathematics so that all students recognize reasoning and proof as essential and powerful parts of mathematics.
How much time would the hare have to waste for the tortoise to win a 1-mile race?	Spreadsheets	Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students develop a disposition to formulate, represent, abstract, and generalize in situations within and outside mathematics.
Plot the yield per acre for grain crops grown in the Midwest.	Spreadsheets	Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students build new mathematical knowledge through their work with problems.
Shapes around us.	Databases	Mathematics instructional programs should include attention to geometry and spatial sense so that all students analyze characteristics and properties of two- and three-dimensional geometric objects.
Real world examples of fractions.	Databases	Mathematics instructional programs should foster the development of number and operation sense so that all students understand numbers, ways of representing numbers, relationships among numbers, and number systems.
Use graphics to demonstrate different types of symmetry.	Presentations	Mathematics instructional programs should include attention to geometry and spatial sense so that all students recognize the usefulness of transformations and symmetry in analyzing mathematical situations.
Depict math concepts in motion.	Presentations	Mathematics instructional programs should emphasize connections to foster understanding of mathematics so that all students recognize, use, and learn about mathematics in contexts outside of mathematics.
Online Mathematics dictionaries or Encyclopedias.	Web Browsers	Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students build new mathematical knowledge through their work with problems.
Using real statistical data in websites - e.g., census, various report in governments or research centers.	Web Browsers	Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students develop and evaluate inferences, predictions, and arguments that are based on data.

Activities	Tools	Sample National Content Area Standards
Using real statistical data in websites - e.g., census, various report in governments or research centers.	Web Browsers	Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students develop and evaluate inferences, predictions, and arguments that are based on data.
Communicate with other students.	Communication Tools	Mathematics instructional programs should use communication to foster understanding of mathematics so that all students extend their mathematical knowledge by considering the thinking and strategies of others.
Communicate with experts.	Communication Tools	Mathematics instructional programs should use communication to foster understanding of mathematics so that all students express mathematical ideas coherently and clearly to peers, teachers, and others.

Sample Lesson Plans: MATHEMATICS

Shapes Shows

PLANNING

Topic: Geometric shapes

Time: 1 week (30 minutes - 1 hour each day)

Class: Grades 1-4

Content Standards addressed:

NCTM Standard for K-12: Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Technology Standards addressed:

NETS Standard 3: Students use technology tools to enhance learning, increase productivity, and promote creativity.

NETS Standard 4: Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

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Materials:

1. Everyday examples of two-dimensional and three-dimensional shapes
2. Digital camera(s)
3. Electronic presentation software

Objectives:	Bloom's Taxonomy:	Assessment:
1. Identify two-dimensional and three dimensional geometric shapes	Comprehension	"Shapes" handout, electronic presentation and rubric
2. Classify everyday objects as two dimensional and three dimensional shapes	Analysis	"Shapes" handout, electronic presentation and rubric

TEACHING

Teacher Procedures:	Student Procedures:
Prior to the Computer	
1. Review with students basic two-dimensional shapes (e.g., square, rectangle, circle), being sure to emphasize the unique characteristics of each shape. Feel free to use manipulatives and everyday objects from your classroom to illustrate the shapes. 2. With photos or manipulatives, ask students to identify characteristics of new two-dimensional objects, including pentagon, hexagon and octagon, basing their conclusions off the characteristics of square and rectangle. 3. Add three-dimensional objects, including sphere, cylinder, cone and cube. Emphasize the unique geometric characteristics of these objects. Teacher may ask students for everyday examples, such basketballs, ice cream cones, ice cubes, etc. 4. Distribute to students the 'Shapes' handout. Ask students to bring in examples from home examples of each of the shapes. The teacher may also provide examples. 5. Following the 'Shapes' handout, direct individual students to choose at least two examples that match each of the shapes. With a digital camera have students take pictures of their examples. Have students write down on their 'Shapes' handout their two examples in the spaces provided. *Note: Teacher/parents/aids may need to assist with digital camera operations. Because of the large memory in digital cameras today, teachers may choose to take a picture of each student before they begin taking their shape pictures in order to organize the photos.*	1. Students answer as called upon to forward review of two-dimensional shapes. 2. Students answer to identify characteristics of new shapes. 3. Students may provide everyday examples. 4. Students bring in examples. 5. Following 'Shapes' handout student choose sexamples of shapes, takes digital camera pictures and writes down his/her specific examples on handout in the space provided.

At the Computer	
1. In an electronic presentation program such as Microsoft Powerpoint, direct students to create slides of each shape following the 'Shapes' handout. 2. Direct students to import/insert photos of each shape on the appropriate slides. 3. Print out slides with multiples per page (such as handouts four-per-page in Microsoft Powerpoint).	1. Using presentation program, students create slideshow, using appropriate slide layouts as necessary. 2. Students import/insert photos onto appropriate slides. 3. Students print out slides.
After the Computer	
1. Direct students to write a description of the shapes in the students own words with the photos. Younger students may draw the individual shapes in a space using 'Shapes' handout as reference.	1. Students write description of each shape on printed slides. .

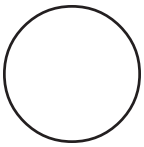
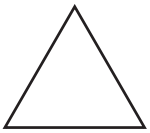
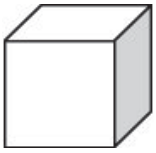
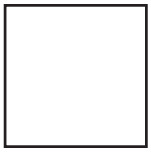
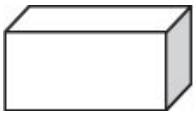
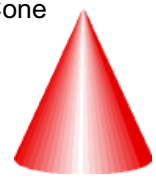
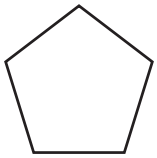
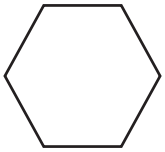
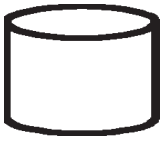
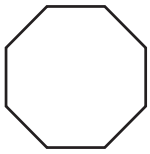
Resources:

1. Miriam Gomez's lesson plan at http://www.teachnet-lab.org/miami/2004/gomez2.htm
2. Microsoft Clip Art and Media at http://office.microsoft.com/clipart/
3. Adapted from Rose Sedely's lesson at http://ali.apple.com/ali_sites/deli/exhibits/1000171/The_Lesson.html

Assessment

CRITERIA	☺ Yes	😐 Somewhat	☹ No
Home Examples: Correctly identified examples brought from home or classroom			
Circle			
Triangle			
Square			
Rectangle			
Pentagon			
Hexagon			
Octagon			
Sphere			
Cube			
Cuboid			
Cone			
Pyramid			
Cylinder			
Digital Camera Examples: Classified examples into correct shape categories in presentation			
Circle			
Triangle			
Square			
Rectangle			
Pentagon			
Hexagon			
Octagon			
Sphere			
Cube			
Cuboid			
Cone			
Pyramid			
Cylinder			

Shapes

Two-Dimentional (2D)		Two-Dimentional (2D)	
Circle 	Home Examples: _____ _____ Digital Camera Examples: _____ _____	Sphere 	Home Examples: _____ _____ Digital Camera Examples: _____ _____
Triangle 	Home Examples: _____ _____ Digital Camera Examples: _____ _____	Cube 	Home Examples: _____ _____ Digital Camera Examples: _____ _____
Square 	Home Examples: _____ _____ Digital Camera Examples: _____ _____	Cuboid 	Home Examples: _____ _____ Digital Camera Examples: _____ _____
Rectangle 	Home Examples: _____ _____ Digital Camera Examples: _____ _____	Cone 	Home Examples: _____ _____ Digital Camera Examples: _____ _____
Pentagon 	Home Examples: _____ _____ Digital Camera Examples: _____ _____	Pyramid 	Home Examples: _____ _____ Digital Camera Examples: _____ _____
Hexagon 	Home Examples: _____ _____ Digital Camera Examples: _____ _____	Cylinder 	Home Examples: _____ _____ Digital Camera Examples: _____ _____
Octagon 	Home Examples: _____ _____ Digital Camera Examples: _____ _____		

STUDENT'S EXAMPLE

Shapes Shows Presentation Sample

Shapes Show

By Lisa Brasher

2-dimensional Shapes

Circle

- No sides and the distance from the center is always the same.

Triangle

- 3 sides

Square

- 4 sides and 4 corners
- All the sides have to be the same size
- 4 right angles

Rectangle

- 4 sides
- The sides don't have to be the same length
- 4 right angles

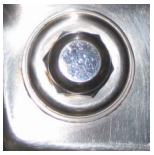
Shapes Shows Presentation Sample

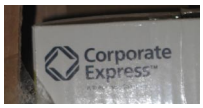
Pentagon

- 5 sides

Hexagon

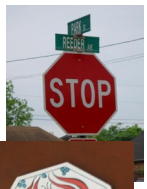
- 6 sides

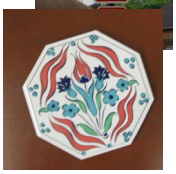




Octagon

- 8 sides





3-Dimensional Shapes

Sphere

- A 3D circle
- The distance from the middle to the outside edge has to be the same.

Cube

- 6 faces
- All the faces are squares with right angles

Shapes Shows Presentation Sample

Rectangular Prism/Cuboid

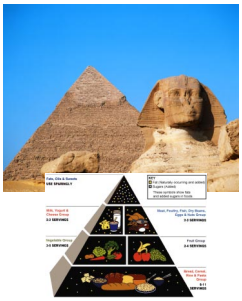
- 6 faces
- Has rectangle faces with right angles
- Can have square faces but not all of them

Cone

- Has a circle on the base and comes up to a point

Pyramid

- Has a square for a base and comes up to a point



Cylinder

- Like a rectangular prism but has 2 circles as bases, can shape

Sample Lesson Plans: MATHEMATICS

Is Each Bag of M&Ms the Same?

PLANNING

Topic: Mathematics

Time: 45 minutes for 2 days

Class: Grades 5-8

Content Standards addressed:

WV Mathematics Standards
MA.6.5.1 - collect, organize, display, and read data using appropriate graphs and tables.
MA.6.1.6 - solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.9 - find the percent of a number.

Technology Standards addressed:

Standard 3: Technology productivity tools: Students use technology productivity tools to collaboratively construct completed products that represent quality work.

Standard 5: Technology research tools: Students use technology tools to locate, evaluate, and collect information from a variety of sources, process data, and report materials.

Materials:

1. One package of M&M chocolate candies per group
2. One Problem-Solving Sheet per group
3. One Spreadsheet Planning Sheet per group
4. Computer
5. Microsoft Excel
6. Microsoft Word
7. Pencil

Objectives:	Bloom's Taxonomy:	Assessment:
1. TLW develop spreadsheet formulas that correctly calculate the required data	Comprehension	Spreadsheet Rubric
2. TLW create meaningful spreadsheet graphs	Knowledge, comprehension,	Spreadsheet Rubric
3. TLW interpret data with regard to the given problem	Analysis	Report Rubric
4. TLW summarize conclusions in a data-supported report	Synthesis, evaluation	Report Rubric

TEACHING

Introduction:

Begin the lesson by introducing the following problem to the whole class and briefly discussing the need for quality control teams, how quality control teams collect and use data to make decisions, and how they use software tools like spreadsheets to support their work.

You are a Quality Control Engineer for Mars ® Incorporated, which manufactures m&m candies. Mars has Quality Control Engineers for three areas: taste, packaging, and contents. You are on the team for contents. You and your team must inspect a random sample of m&m packages to determine if the contents are of high quality with regard to matching the published color distribution. These percentages are located at the following site: http://us.mms.com/us/about/products/milkchocolate/

Your team is to summarize the results of your study in a brief report to the Vice President of Quality Control. She expects data to be displayed in the report.

Teacher Procedures:	**Student Procedures:**
Prior to the Computer	
1. Distribute one Problem-Solving Worksheet to each group and ask them to complete each step 2. Provide time for student groups to ask questions 3. Give each group one Spreadsheet Planning Sheet and them to collaboratively plan the spreadsheet layout by adding column and row names for the collected data (e.g., number of candies in each color for the 5 bags of candies) – and – writing the needed formulas (overall percent of red candies in the 5 bags). 4. Use digital projector or a white board to create a consistent spreadsheet layout. Begin by having one group share their design, then modify as needed. 5. Repeat the above procedure to ensure all students use the correct formula. 6. Student groups open their bag of m&m's and record the number of candies by color on their group's modified Spreadsheet Planning Sheets and on the class spreadsheet just created.	Each student group completes the following: 1. Complete the Problem-Solving Worksheet 2. Complete Spreadsheet Planning Sheet 3. Collect data by counting and recording the number of candies by color on your group's planning sheet and on the class spreadsheet. 4. Draft a report that uses a chart and a descriptive summary to present the results.

At the Computer	
1. Model creating setting up a spreadsheet (if needed) 2. Model creating a chart/graph (if needed) 3. Model inserting an Excel chart into a Word document (if needed)	1. Each group sets up spreadsheet according to the layout chosen by the class – including adding formulas 2. Each group enters data from their planning sheets and class data in the appropriate columns 3. Use formulas to calculate results 4. Go to this URL to obtain M&M's data http://us.mms.com/us/about/products/milkchocolate/ 5. Enter the data into the spreadsheet 6. Create a chart/graph showing the class data vs. M&M's data 7. After interpreting the data, create a data-supported report presenting the results
After the Computer	
1. Ask student to interpret the data on the charts and graphs and draft a brief report to the Vice President.	1. Read and interpret graphs 2. Share reports with class.

Resources:

1. Kentucky Curriculum Standards
2. NETS for Students
   Microsoft Excel application
3. Microsoft Word application
4. M&M website
5. Rubistar (http://rubistar.4teachers.org/index.php)

Assessment

SPREADSHEET RUBRIC				
CRITERIA	**1**	**2**	**3**	**4**
TLW develop spreadsheet formulas	Very few or none of the formulas are accurate and produce the results necessary to solve the lesson problem.	Only a few of the formulas are accurate and produce the results necessary to solve the lesson problem.	Almost all of the formulas are accurate and produce the results necessary to solve the lesson problem.	All formulas are accurate and produce the results necessary to solve the lesson problem.
TLW create meaningful graphs	The graph(s) are not included or contains major errors , uses the wrong format, contains irrelevant data, and is mislabeled.	The graph(s) contains a few major errors, uses a somewhat meaningful format, mostly contains irrelevant data, and uses labels that are not easy to understand.	The graph(s) contains a few minor errors, uses a meaningful format, mostly contains relevant data, and uses labels that are somewhat easy to understand.	The graph(s) contains no errors, uses a very meaningful format, contains relevant data, and uses labels that are easy to understand.
TLW interpret data with regard to the given problem	The data interpretation does not reflect the results for the given context.	The data interpretation poorly reflects the results for the given context.	The data interpretation is a somewhat accurate reflection the results within the given context.	The data interpretation accurately reflects the results within the given context.
TLW summarize conclusions in a data-supported report	Information in the report has little or no organization and the table(s) and graph(s) are missing or provide little to no support for the conclusions.	Information in the report is loosely organized with and table(s) and graph(s) provide moderate support for the conclusions.	Information in the report is organized with and supports the conclusions with table(s) and graph(s).	Information in the report is very organized with and fully supports the conclusions with meaningful table(s) and graph(s).

Probelm-Solving Worksheet Template

Group Members: _____ Date: _____

_____

_____

_____

_____

Directions: Use the following chart to plan how your group will approach this probelm-solving task

Component	*Student Action*
Define the problem	Write a statement that clearly defines the problem. _____ _____
What do we know about the problem?	List ideas stated as facts _____ _____
What do we need to know to solve the problem?	List as questions. _____ _____
What data do we need to collect to solve the problem?	Write as action statements and indicate how to collect. _____ _____
How do we manipulate the data?	Describe how the data will be manipulated to develop a solution. _____ _____
What are some possible solutions?	List solutions that are based on results of the data manipulation. _____ _____
How will each solution be evaluated?	List criteria that will be used to select the best solution. _____ _____
How will the best solution be selected?	Consider each solution and identify the implications of each. _____ _____
How will the findings be presented?	Describe how the results will be published. _____ _____

Morrison & Lowther (2002)

Spreadsheet Planning Template

Use this template to design the spreadsheet needed to solve the problem

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

Formulas needed to solve this problem

Use the space below to plan each formula nedded to solve the problem.

e.g., Name: Total red candies in all bags
Formula= B2+C2+D2+E2+F2

Name: _____

Formula = _____

Name: _____

Formula = _____

Name: _____

Formula = _____

Name: _____

Formula = _____

STUDENT'S EXAMPLE

Class Data Sample

M_M2.XLS

	A	B	C	D	E	F	G	H	I	J
1	COLOR	Bag 1	Bag 2	Bag 3	Bag 4	Bag 5	Total	Team %	M&M® %	Difference
2	Brown	16	17	13	11	12	69	25.2%	13.0%	-12.2%
3	Blue	11	8	12	8	9	48	17.5%	24.0%	6.5%
4	Orange	7	10	8	9	12	46	16.8%	20.0%	3.2%
5	Green	9	7	9	12	8	45	16.4%	16.0%	-0.4%
6	Red	8	11	9	8	5	41	15.0%	13.0%	-2.0%
7	Yellow	4	3	5	6	7	25	9.1%	14.0%	4.9%
8	TOTAL	55	56	56	54	53	274	100.0%	100.0%	0.0%

Class Data with Formulas Sample

COLOR	Bag 1	Bag 2	Bag 3	Bag 4	Bag 5	Total	Team %	M&M®%	Difference
Brown	16	17	13	11	12	=SUM(B2:F2)	=G2/274	0.13	=I2-H2
Blue	11	8	12	8	9	=SUM(B3:F3)	=G3/274	0.24	=I3-H3
Orange	7	10	8	9	12	=SUM(B4:F4)	=G4/274	0.2	=I4-H4
Green	9	7	9	12	8	=SUM(B5:F5)	=G5/274	0.16	=I5-H5
Red	8	11	9	8	5	=SUM(B6:F6)	=G6/274	0.13	=I6-H6
Yellow	4	3	5	6	7	=SUM(B7:F7)	=G7/274	0.14	=I7-H7
TOTAL	=SUM(B2:B7)	=SUM(C2:C7)	=SUM(D2:D7)	=SUM(E2:E7)	=SUM(F2:F7)	=SUM(B8:F8)	=G8/274	=SUM(I2:I7)	=I8-H8

Sample Report

MARS Inc.®
Division of M&M® Candies

Quality Control Report for Milk Chocolate M&M® Candies
Specific Topic: Color Distribution

Purpose of the Study:

The quality control team for contents recently conducted a study to see if random samples of milk chocolate M&M's® contained colors similar to the percentages that MARS Inc.® publishes on their web site.

Procedure:

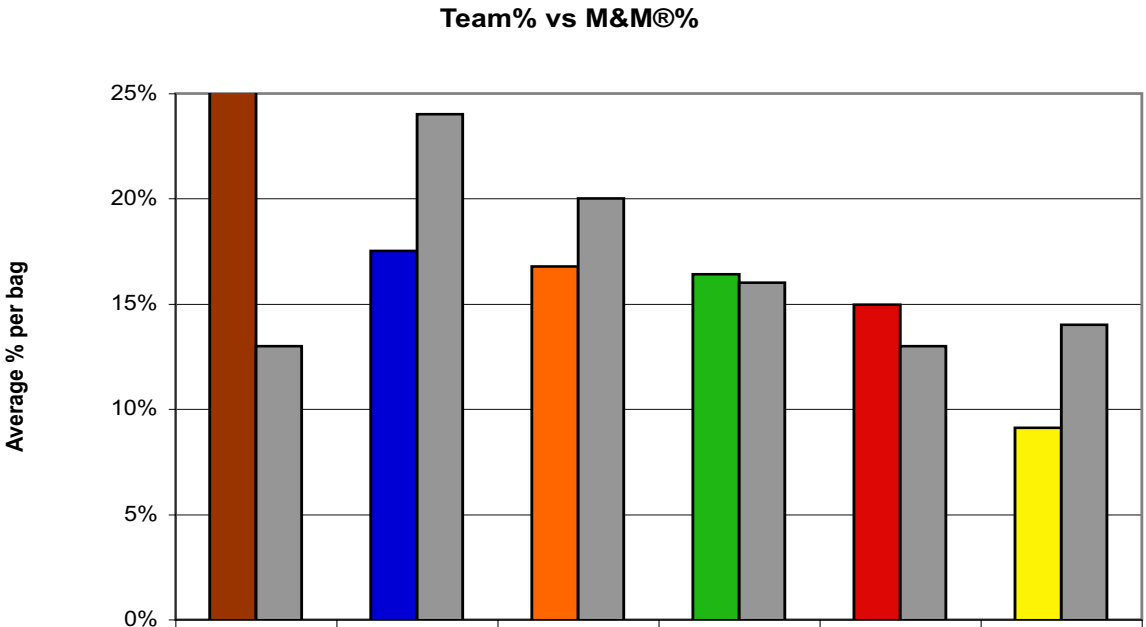
The study involved examining the contents of 5 bags of m ilk chocolate M&M's® candies to determine the number of candies per color found in each bag. From these numbers we then determined an overall percent of candies per color for the five bags. These percentages were then compared with the published color distribution for this candy.

Results

The results of the study are seen in the following Table 1 and Figure 1. As can be seen, the percent of green candies only differed by 0.4% from that published on the web and there was only 2.0% difference for red and 3.2% for orange. The greatest difference was for the brown candies. The bags of candies examined by our Team had 25.2% brown candies as compared to the 13.0% reported by MARS Inc.®

Table 1. Team vs. M&M®: Percent of Colors per Bag

COLOR	Bag 1	Bag 2	Bag 3	Bag 4	Bag 5	Total	Team %	M&M® %	Difference
Brown	16	17	13	11	12	69	25.2%	13.0%	-12.2%
Blue	11	8	12	8	9	48	17.5%	24.0%	6.5%
Orange	7	10	8	9	12	46	16.8%	20.0%	3.2%
Green	9	7	9	12	8	45	16.4%	16.0%	-0.4%
Red	8	11	9	8	5	41	15.0%	13.0%	-2.0%
Yellow	4	3	5	6	7	25	9.1%	14.0%	4.9%
TOTAL	55	56	56	54	53	274	100.0%	100.0%	0.0%



	Brown	Blue	Orange	Green	Red	Yellow
Team %	25.2%	17.5%	16.8%	16.4%	15.0%	9.1%
M&M® %	13.0%	24.0%	20.0%	16.0%	13.0%	14.0%

Figure 1. Overall Percent of Color per bag by Team vs. M&M®

Discussion

The results of this study show that MARS Inc.® is doing a fairly good job of maintaining the percent of green, red, and orange candies per bag. There was less consistency with regard to the yellow (4.9% difference) and blue (6.5% difference), and even greater differences seen for the brown candies (-12.2%).

Recommendations

The Quality Control Team for Contents recommends that MARS Inc.® conduct further research to determine why the color distribution varies from the published numbers by over 10% for the brown candies and almost 10% for the blue. It also recommends conducting a customer survey to find out which colors most people would like to have when they buy M&M® milk chocolate candies. The survey results could be used to set the new percent of colors per bag.

Technology Integration Ideas: SCIENCE

Below are examples of activities and tools for teachers to integrate technology in the Science area. Also included are the approprate national standards for each activity from National Science Education Standards. Copyright 1996 by the National Academy of Sciences, courtesy of the National Academy Press, Washington, D.C.

Activities	Tools	Sample National Content Area Standards
Plot average yearly precipitation in your county for the past 50 years.	Spreadsheets	Science personal and social perspectives - Populations, resources, and environments
Compare miles traveled during migration for 10 different birds.	Spreadsheets	Life Science - Populations and ecosystems
Compare the number of U.S. vs. Asian yearly earthquake occurrences for the past 50 years.	Spreadsheets	Earth and space science - Structure of the earth system
Compare grams of sugar in breakfast cereals.	Spreadsheets	Science in personal and social perspectives - personal health
Use data to demonstrate whether or not the environmental protection efforts are working.	Spreadsheets	Science in personal and social perspectives - Populations, resources, and environments
Digestive systems of organisms - from bacteria to mammals.	Databases	Life Science - Structure and function in living systems
Experimental approaches of famous scientist, e.g., Edison, Watt, Bell.	Databases	Nature of science - Many individuals have contributed to the traditions of science
Dinosaur characteristics.	Databases	Life science - Population and ecosystem Earth and space science - Earth's history
Genetic traits of students.	Databases	Life science - Reproduction and heredity
Nutrients of common food.	Databases	Life science - Matter, energy, and organization in living system
Compare and/or Contrast: Oceans vs. Seas.	Concept Maps	Earth and space science - Structure of the earth system
Compare and/or Contrast: Plant cells vs. Animal cells.	Concept Maps	Life science - the cell
Create a TimeLine: Seed to Plant.	Concept Maps	Life science - Life cycles of organisms

Activities	Tools	Sample National Content Area Standards
Create a TimeLine: Sunlight to Food.	Concept Maps	Life science - Population and ecosystem
Create a TimeLine: Space Program.	Concept Maps	Earth and space science - Earth in the solar system
Create a TimeLine: Rise and Fall of Dinosaurs.	Concept Maps	Earth and space science - Earth's history
Plot Main Ideas: Four Seasons	Concept Maps	Science in personal and social perspectives - Populations, resources, and environments
Demonstrate the before and after of key chemical reactions.	Presentations	Physical science - Chemical reaction
Illustrate the difference between electrical vs. chemical energy.	Presentations	Physical science - Transfer of energy
Create a virtual elevator ride to the Earth's center.	Presentations	Earth and space science - Structure of the earth system
Explain why it rains.	Presentations	Earth and space science - Changes in earth and sky
Compare the role of insects' antennas to humans' five senses.	Presentations	Life Science - Structure and function in living systems
Current Events - Science and Technology	Web Browsers	Science in personal and social perspectives - Science and technology in society
Online Dictionaries or Encyclopedias.	Web Browsers	Science as inquiry - Develop descriptions, explanations, predictions, and models using evidence and explanations.
Online calculators - e.g., graphing, interest calculations.	Web Browsers	Science as inquiry - Use mathematics in all aspects of scientific inquiry.
Explore the Moon with a virtual reality.	Web Browsers	Earth and space science - Objects in the sky
Communicate with other students.	Communication Tools	Science as a human endeavor: - Women and men of various social and ethnic backgrounds engage in the activities of science, engineering, and related fields.
Communicate with researchers, scientists or doctors.	Communication Tools	Understanding about science and technology: - Many different people in different cultures have made and continue to make contributions to science and technology.

Sample Lesson Plans: SCIENCE

Do Birds Eat Three Times a Day?

PLANNING

Topic: Science

Time: 15 minutes for 5 days, 1 hour on the final day

Class: Grades 3-8, Science

Content Standards addressed:

Memphis City Schools Science Standard #1:Students should be able to solve real-world problems through scientific inquiry methods (questioning, predicting, experimenting, collecting and displaying information, and drawing valid conclusions), using appropriate technology to communicate ideas and solutions effectively.

Memphis City Schools Science Standard #3: Students should be able to use knowledge of the similarities, differences and interdependence of living things to analyze and assess events and actions that impact life on Earth.

Technology Standards addressed:

Standard 3: Technology productivity tools: Students use technology productivity tools to collaboratively construct completed products that represent quality work.

Standard 5: Technology research tools: Students use technology tools to locate, evaluate, and collect information from a variety of sources, process data, and report materials.

Materials:

1. ZooCam webpage (http://zoocam.memphis.edu)
2. Data Gathering sheet
3. Computer
4. Microsoft Excel program
5. pencil

Objectives:	Bloom's Taxonomy:	Assessment:
1. TLW develop a hypothesis	Comprehension	Class Hypothesis
2. TLW collect observational data on animals.	Knowledge, comprehension	Data Gathering sheet
3. TLW depict observational data using graphs.	Application	Excel graph
4. TLW interpret observational data with respect to hypothesis.	Analysis	Lab Report

TEACHING

Introduction:
As a whole group, begin by asking the students how many times a day they eat? Ask the students about other animals' (bears, dolphins, lizards, etc.) eating habits.

Teacher Procedures:	Student Procedures:
Prior to the Computer	
1. Based on the initial discussion, help the class develop a hypothesis about birds' eating habits. 2. Distribute and discuss instructions for data gathering chart.	1. Develop and record a hypothesis of birds' eating habits. 2. Review data gathering sheet.
At the Computer	
1. Direct students to the zoocam website at the appropriate times (morning, noon, afternoon) each day for 5 minutes. 2. Model building a chart in Excel. 3. Model creating graphs from charts in Excel.	1. Go to the zoocam website 2. Make observations and record data on Data Gathering Sheet for allotted time 3. Build Excel chart with recorded data 4. Create graphs based on data in Excel chart.
After the Computer	
1. Ask student to interpret the data on the charts and graphs. 2. Ask student to compare finding to the original hypothesis.	1. Read and interpret graphs 2. In a Lab Report, discuss results and compare findings to the hypothesis. Draw conclusions about the data, such as reliability of the data and any limitations of the methods.

Resources:

1. ZooCam website (http://zoocam.memphis.edu)
2. Memphis City Schools TLA website (http://www.memphis-schools.k12.tn.us/admin/tlapages/academyhome.html)
3. Microsoft Excel application
4. Rubistar (http://rubistar.4teachers.org/index.php)

ASSESSMENT

LAB REPORT				
CRITERIA	4	3	2	1
Problem Statement	The purpose of the lab or the question to be answered during the lab is clearly identified and stated.	The purpose of the lab or the question to be answered during the lab is identified, but is stated in a somewhat unclear manner.	The purpose of the lab or the question to be answered during the lab is partially identified, and is stated in a somewhat unclear manner.	The purpose of the lab or the question to be answered during the lab is erroneous or irrelevant.
Hypothesis	Hypothesized relationship between the variables and the predicted results is clear and reasonable based on what has been studied.	Hypothesized relationship between the variables and the predicted results is reasonable based on general knowledge and observations.	Hypothesized relationship between the variables and the predicted results has been stated, but appears to be based on flawed logic.	No hypothesis has been stated.
Experimental Design	Experimental design is a well-constructed test of the stated hypothesis.	Experimental design is adequate to test the hypothesis, but leaves some unanswered questions.	Experimental design is relevant to the hypothesis, but is not a complete test.	Experimental design is not relevant to the hypothesis.
Variables	All variables are clearly described with all relevant details.	All variables are clearly described with most relevant details.	Most variables are clearly described with most relevant details.	Variables are not described OR the majority lack sufficient detail.
Procedures & Materials	Procedures and materials are listed in clear steps. Each step is numbered and is a complete sentence.	Procedures and materials are listed in a logical order, but steps are not numbered and/or are not in complete sentences.	Procedures and materials are listed but are not in a logical order or are difficult to follow.	Procedures do not accurately list the steps and materials of the experiment.
Data	Professional looking and accurate representation of the data in tables and/or graphs. Graphs and tables are labeled and titled.	Accurate representation of the data in tables and/or graphs. Graphs and tables are labeled and titled.	Accurate representation of the data in written form, but no graphs or tables are presented.	Data are not shown OR are inaccurate.
Analysis	The relationship between the variables is discussed and trends/patterns logically analyzed. Predictions are made about what might happen if part of the lab were changed or how the experimental design could be changed.	The relationship between the variables is discussed and trends/patterns logically analyzed.	The relationship between the variables is discussed but no patterns, trends or predictions are made based on the data.	The relationship between the variables is not discussed.
Conclusion	Conclusion includes whether the findings supported the hypothesis, possible sources of error, and what was learned from the experiment.	Conclusion includes whether the findings supported the hypothesis and what was learned from the experiment.	Conclusion includes what was learned from the experiment.	No conclusion was included in the report OR shows little effort and reflection.
Scientific Concepts	Report illustrates an accurate and thorough understanding of scientific concepts underlying the lab.	Report illustrates an accurate understanding of most scientific concepts underlying the lab.	Report illustrates a limited understanding of scientific concepts underlying the lab.	Report illustrates inaccurate understanding of scientific concepts underlying the lab.
Spelling, Punctuation and Grammar	One or fewer errors in spelling, punctuation and grammar in the report.	Two or three errors in spelling, punctuation and grammar in the report.	Four errors in spelling, punctuation and grammar in the report.	More than 4 errors in spelling, punctuation and grammar in the report. The Lab report should include:

The Lab report should include:

1. Title
2. Statement of Problem
3. Hypothesis
4. Experimental Design
5. Data & Results
6. Analysis & Conclusion

Student Lab Report Template

Title:
Statement of Problem:
Hypothesis:
Experimental Design:
Data & Results:
Analysis & Conclusion:

Student Data Gathering Sheet

Use this table to gather data on birds' eating habits. Mark (with a tally) the number of birds you see feeding at the times below. If one of the "special" birds is feeding, mark a tally under their column as well. Do this for 5 days. Happy bird watching!

	9 AM				12 AM				3 PM			
	All	LK	PW	SF	All	LK	PW	SF	All	LK	PW	SF
Day 1												
Day 2												
Day 3												
Day 4												
Day 5												

Bird Types*:
All- all birds
LK- Lorikeets (green bird with a red head)
PW- Paradise-Whydah (black bird with a long black tail)
SF- Saffron Finch (small yellow bird)

*Find out more information about the types of birds at the zoo on the website- http://zoocam.memphis.edu

Birds Information Sheet

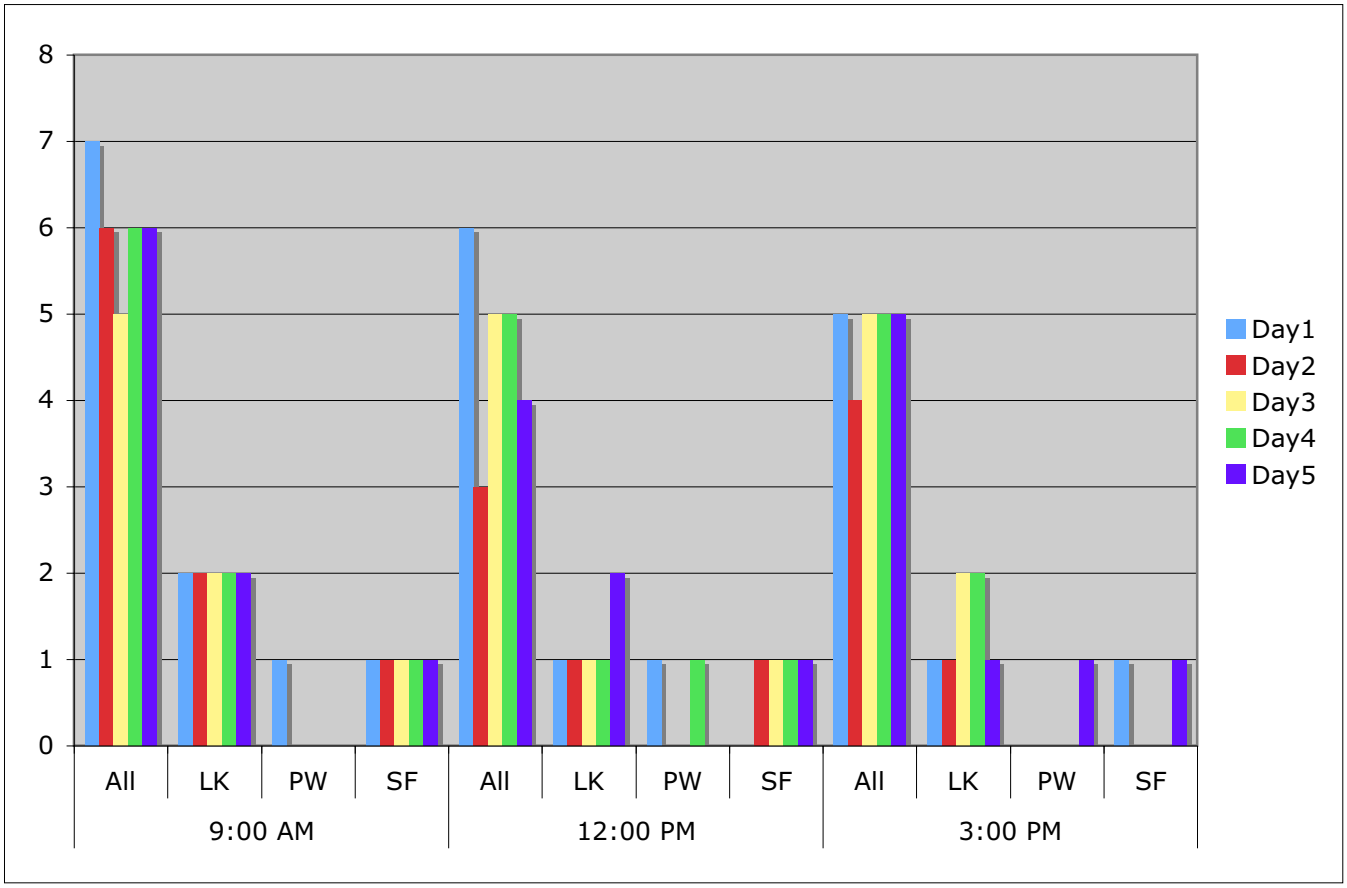
Use the following table as a reference to the birds that you will be observing today.

Type of Birds	Picture of Bird
Lorkeets (LK) is the green bird with a red head	
Paradise Whydah (PW) is the black bird with a long, black tail	
Saffron Finch (SF) is the small yellow bird	

STUDENT'S EXAMPLE

Sample Data Analysis

	9:00 AM				12:00 PM				3:00 PM			
	All	LK	PW	SF	All	LK	PW	SF	All	LK	PW	SF
Day1	7	2	1	1	6	1	1	0	5	1	0	1
Day2	6	2	0	1	3	1	0	1	4	1	0	0
Day3	5	2	0	1	5	1	0	1	5	2	0	0
Day4	6	2	0	1	5	1	1	1	5	2	0	0
Day5	6	2	0	1	4	2	0	1	5	1	1	1
Average	6	2	0.2	1	4.6	1.2	0.4	0.8	4.8	1.4	0.2	0.4



Sample Student Lab Report

Title: Do birds eat three times a day?

Statement of Problem:

The purpose of this experiment is to see if birds in the zoo eat three times a day like human.

Hypothesis:

Birds in the zoo will eat three times a day.

Experimental Design:

Observing object – birds – all birds and specific birds – Lorikeets, Paradise Whydah, Saffron Finch.
What should be observed – the number of times for eating
Observation time – three times a day - 9:00 a.m., 12:00 p.m., 5:00 p.m.
Period of Observation – Five days

Data & Results:

Refer to attached data gathering table and graph.

Analysis & Conclusion:

According to the result, most birds are observed to eat three times a day. However, Paradise Whydah rarely ate at the observing time. The interesting finding is that the average number of eating birds in the morning is 6 which is the highest number. In contrast, the numbers of birds eating in the noon is 4.6 and the one in the evening is 4.8.
In conclusion, this finding supports the hypothesis, but a certain type of bird did not show the pattern. We are not sure if the bird, Paradise Whydah, was sick or the bird has a different eating habit. In addition, we can conclude that birds eat more in the morning than other times.

Sample Lesson Plans: SCIENCE

Our Changing Earth

PLANNING

Topic: Plate Tectonics

Time: 45 minutes

Class: 5-8th grade Science

Science Standards addressed:

Science Standard #4: Students should be able to use knowledge of the Earth and other bodies in the universe to predict and explain natural occurrences, especially those that affect life on Earth.

Technology Standards addressed:

Standard 3: Technology productivity tools: Students use technology productivity tools to collaboratively construct completed products that represent quality work.

Standard 4: Technology communication tools: Students use technology communication tools to communicate information and ideas effectively to multiple audiences.

Standard 5: Technology research tools: Students use technology tools to locate, evaluate, and collect information from a variety of sources, process data and report results.

Materials:

1. Plate Tectonics video clips
2. Inspiration/Kidspiration
3. Textbook & other resources on plate tectonics

Objectives:	Bloom's Taxonomy:	Assessment:
1. Describe plate tectonics	Comprehension	Concept map
2. Describe convergent, divergent and transform shifts occur	Comprehension	Concept map, teacher questioning
3. Hypothesize future plate shifts.	Analysis/Synthesis	Teacher questioning

TEACHING

Introduction:

Use Intro plate tectonic video to stimulate student thinking about natural disasters and what causes these events around them.

Teacher Procedures:	Student Procedures:
Prior to the Computer	
1. Show Intro plate tectonic video (See resources below).	1. Watch Intro video
At the Computer	
2. Introduce students to concept mapping using Inspiration/Kidspiration. Have students brainstorm and then link their initial thinking about continental drift and plate tectonics. 3. Distribute plate tectonics reading passage (See resouces below). 4. Show Review video clip on plate tectonics (See resources below). 5. Provide students opportunity to ask questions about video and reading. 6. Have students revise initial concept map based on new information.	2. Use Inspiration/Kidspiration to build and initial concept map representing their current thinking about plate tectonics, natural disasters and continental drift. 3. Read passage. 4. View Review video clip. 5. Ask supplemental questions as necessary. 6. Revise initial concept map to reflect new knowledge.
After the Computer	
7. With whole group, question students about future plate shifts and possible future natural disasters, including where they are most likely to occur (See resources below)	7. Provide answers to teacher as called upon.

Resources:

1.http://www.edHelper.com for plate tectonics information
2.United Streaming video clips from http://www.unitedstreaming.com

ASSESSMENT

Plate Tectonics Concept Map				
CRITERIA	**4**	**3**	**2**	**1**
Conceptual Understanding (x 2)	Map demonstrates strong conceptual understanding of plate tectonic theory because it is comprehensive and accurate.	Map demonstrates solid conceptual understanding of plate tectonic theory because it is mostly comprehensive and accurate.	Map demonstrates adequate conceptual understanding of plate tectonic theory because it is somewhat comprehensive and accurate.	Map fails to demonstrate adequate conceptual understanding of plate tectonic theory.
Relationship (x 2)	All concepts and ideas are arranged in meaningful location and logical links between ideas are defined.	Most of the concepts and ideas are placed in correct location and logical links between ideas are defined.	Some of the ideas placed in correct location and/or are missing logical links between concepts.	Most of the ideas are placed incorrectly. Location and logical links between concepts are not defined.
Organization (x 2)	Concepts, sub-concept and examples are organized into meaningful categories or sections.	Concepts, sub-concept and examples are mostly organized into meaningful categories or sections.	Map is somewhat disorganized making it difficult to understand.	Map has no organization to subdivide categories or section.
Spelling, and Grammar (x 1)	Concept map is free of spelling and grammar errors.	One or two errors in spelling, and grammar on the concept map.		Frequent errors in spelling and grammar on the concept map.
Appearance (x 1)	Overall layout is easy to follow, visually appealing, and information is easy to read.	Overall layout is fairly easy to follow and generally information is easy to read.	Overall layout is crowded. Information and relationships are difficult to follow.	Overall layout appears confused and messy.

Plate Tectonics Handout and Video Clip

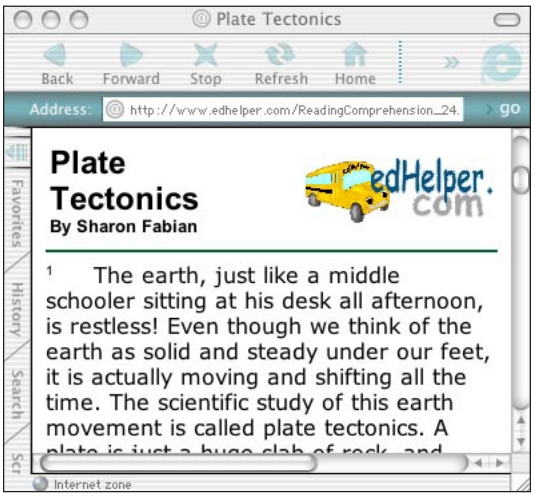


Plate Tectonics Story

from
http://www.edhelper.com/ReadingComprehension_24_81.html

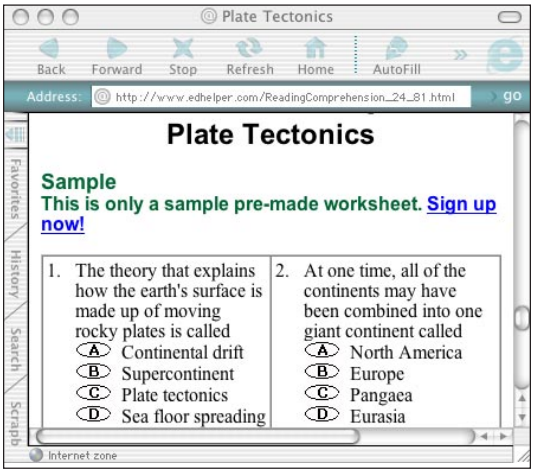


Plate Tectonics Worksheet

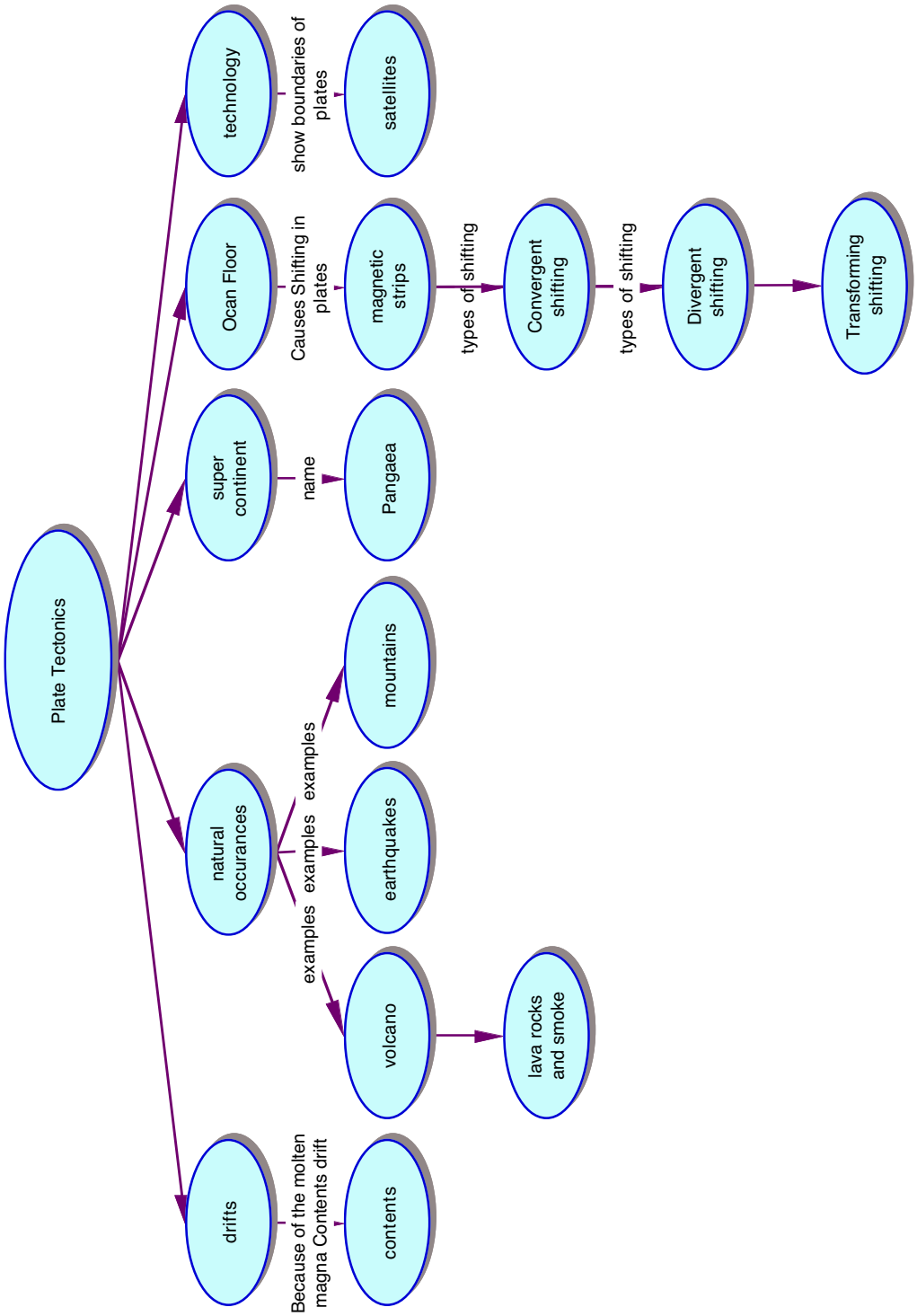
from
http://www.edhelper.com/ReadingComprehension_24_81.html

Video Clip - "Our Changing Earth"

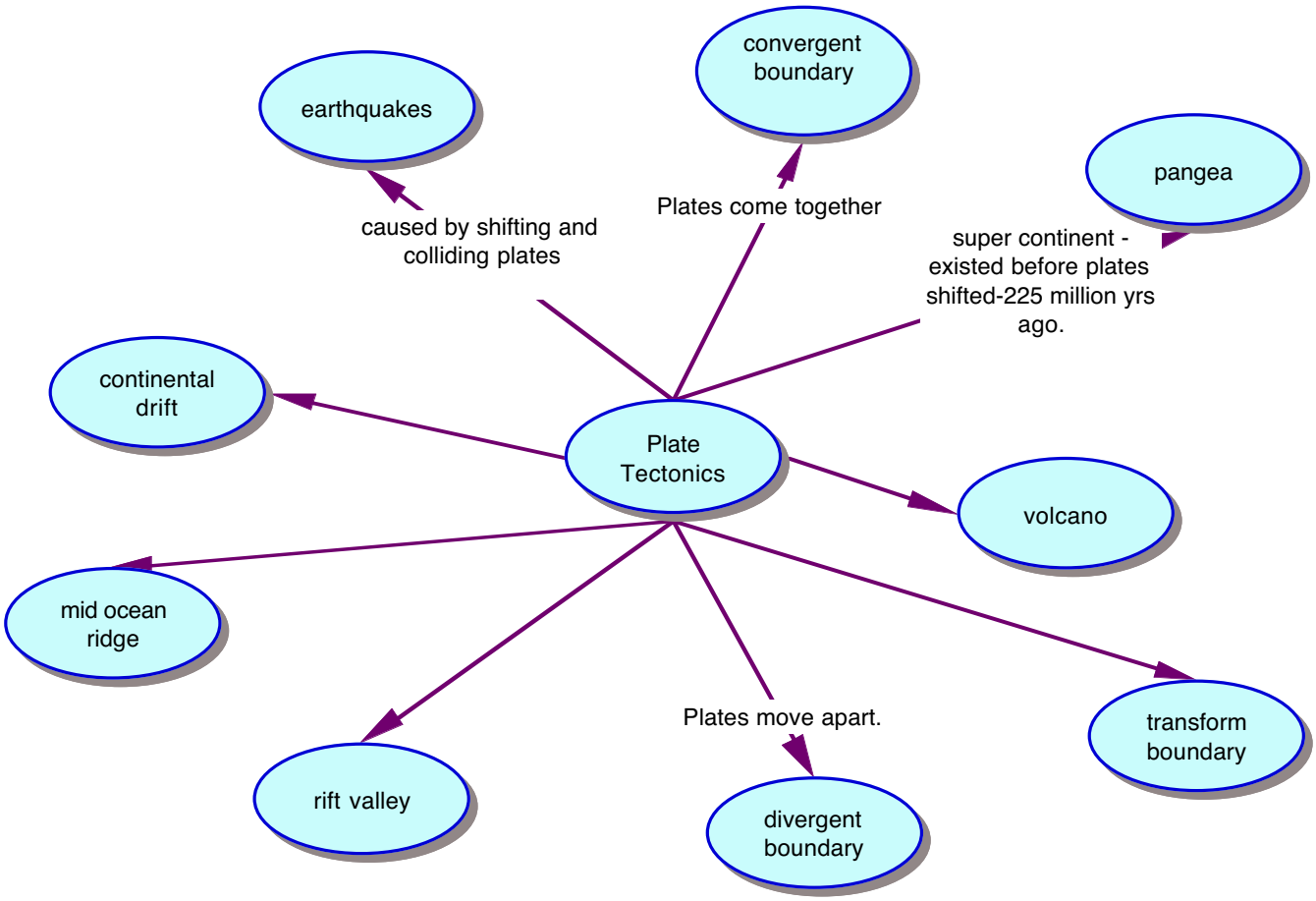
from http://www.unitedstreaming.com

STUDENT'S EXAMPLE

Sample Concept Map



Sample Concept Map



Technology Integration Ideas: SOCIAL STUDIES

Below are examples of activities and tools for teachers to integrate technology in the Social Studies area. Also included are the approprate national standards for each activity from Expectations of Excellence — Curriculum Standards for Social Studies published by National Council for the Social Studies, 1994, pp. 33-45

Activities	Tools	Sample National Content Area Standards
Features of U.S. state flags	Databases	Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can give examples of how experiences may be interpreted differently by people from diverse cultural perspectives and frames of reference.
Government structures of different countries	Databases	Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can compare similarities and differences in the ways groups, societies, and cultures meet human needs and concerns.
Features of the tallest mountains	Databases	Social studies programs should include experiences that provide for the study of people, places and environments, so that the learner can locate and distinguish among varying landforms and geographic features, such as mountains, plateaus, islands, and oceans.
U.S. Wars	Databases	Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time, so that the learner can compare and contrast different stories or accounts about past events, people, places, or situations, identifying how they contribute to our understanding of the past.
Female authors of the 1800's	Databases	Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time, so that the learner can identify and describe selected historical periods and patterns of change within and across cultures, such as the rise of civilizations, the development of transportation systems, the growth and breakdown of colonial systems, and others.
Governors from our state	Databases	Social studies programs should include experiences that provide for the study of how people create and change structures of power, authority, and governance, so that the learner can identify and describe the basic features of the political system in the United States, and identify representative leaders from various levels and branches of government.

Activities	Tools	Sample National Content Area Standards
Compare and/or Contrast: Pilgrims vs. Native Americans.	Concept Maps	Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can compare ways in which people from different cultures think about and deal with their physical environment and social conditions.
Compare and/or Contrast: Matisse vs. Monet.	Concept Maps	socail studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can describe ways in which language, stories, folktales, music, and artistic creations serve as expressions of culture and influence behavior of people living in a particular culture.
Compare and/or Contrast: Farm life vs. City life.	Concept Maps	Social studies programs should include experiences that provide for the study of people, places and environments, so that the learner can examine the interaction of human beings and their physical environment, the use of land, building of cities, and ecosystem changes in selected locales and regions.
Compare and/or Contrast: City vs. State vs. National Government.	Concept Maps	Social studies programs should include experiences that provide for the study of how people create and change structures of power, authority, and governance, so that the learner can distinguish among local, state, and national government and identify representative leaders at these levels such as mayor, governor, and president.
Create a TimeLine: Your Life.	Concept Maps	Social studies programs should include experiences that provide for the study of individual development and identity, so that the learner can describe personal changes over time, such as those related to physical development and personal interests.
Create a TimeLine: Civil Rights in the U.S.	Concept Maps	Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time, so that the learner can demonstrate an ability to use correctly vocabulary associated with time such as past, present, future, and long ago; read and construct simple timelines; identify examples of change; and recognize examples of cause and effect relationships.
Plot Main Ideas: Money.	Concept Maps	Social studies programs should include experiences that provide for the study of how people organize for the production, distribution, and consumption of goods and services, so that the learner can explain and demonstrate the role of money in everyday life.
Showcase items of interest within 100 miles of our school	Presentations	Social studies programs should include experiences that provide for the study of people, places and environments, so that the learner can examine the interaction of human beings and their physical environment, the use of land, building of cities, and ecosystem changes in selected locales and regions.

Activities	Tools	Sample National Content Area Standards
Document the history of money	Presentations	Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time, so that the learner can identify and describe selected historical periods and patterns of change within and across cultures, such as the rise of civilizations, the development of transportation systems, the growth and breakdown of colonial systems, and others.
Showcase postcard from Asia	Presentations	Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can describe ways in which language, stories, folktales, music, and artistic creations serve as expressions of culture and influence behavior of people living in a particular culture.
Create a "Countries of Our Heritage" for our class.	Presentations	Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can describe ways in which language, stories, folktales, music, and artistic creations serve as expressions of culture and influence behavior of people living in a particular culture.
Show tessellations through time.	Presentations	Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time, so that the learner can demonstrate an ability to use correctly vocabulary associated with time such as past, present, future, and long ago; read and construct simple timelines; identify examples of change; and recognize examples of cause and effect relationships.
Visualize what happens to a vote.	Presentations	Social studies programs should include experiences that provide for the study of the ideals, principles, and practices of citizenship in a democratic republic, so that the learner can explain actions citizens can take to influence public policy decisions.
Web document - e.g., U.S. Constitution	Web Browsers	Social studies programs should include experiences that provide for the study of the ideals, principles, and practices of citizenship in a democratic republic, so that the learner can identify key ideals of the United States' democratic republican form of government, such as individual human dignity, liberty, justice, equality, and the rule of law, and discuss their application in specific situations.
Video - e.g., Martin Luther King - "I have a Dream"	Web Browsers	Social studies programs should include experiences that provide for the study of the ideals, principles, and practices of citizenship in a democratic republic, so that the learner can recognize that a variety of formal and informal actors influence and shape public policy.

Activities	Tools	Sample National Content Area Standards
Internet News about green house effect.	Web Browsers	Social studies programs should include experiences that provide for the study of global connections and interdependence, so that the learner can explore the causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as health, security, resource allocation, economic development, and environmental quality.
Current Events - Sports or Foreign Relations	Web Browsers	Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can articulate the implications of cultural diversity, as well as cohesion, within and across groups.
Online Dictionaries or Encyclopedias - searching stock market	Web Browsers	Social studies programs should include experiences that provide for the study of how people organize for the production, distribution, and consumption of goods and services, so that the learner can describe a range of examples of the various institutions that make up economic systems such as households, business firms, banks, government agencies, labor unions, and corporations.
Statistical Data - e.g., census, employment	Web Browsers	Social studies programs should include experiences that provide for the study of interactions among individuals, groups, and institutions, so that the learner can demonstrate an understanding of concepts such as role, status, and social class in describing the interactions of individuals and social groups.
A virtual museum on the Web	Web Browsers	Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time, so that the learner can compare and contrast different stories or accounts about past events, people, places, or situations, identifying how they contribute to our understanding of the past.
Communicate with government officers	Communication Tools	Social studies programs should include experiences that provide for the study of how people create and change structures of power, authority, and governance, so that the learner can recognize how groups and organizations encourage unity and deal with diversity to maintain order and security.

Sample Lesson Plans: SOCIAL STUDIES

Get the Sense of the Census!

PLANNING

Topic: Population

Time: 45 minutes for 2 days

Class: Grades 5-8, Social Studies & Match

Content Standards addressed:

Memphis City School Social Studies Standard #3: Students should be able to analyze the impact of location and the interactions between the environment and people across continents.

Memphis City School Social Studies Standard #4: Students should be able to predict world conditions, based on a knowledge of past and present social, political, and economic conditions.

Technology Standards addressed:

Standard 3: Technology productivity tools: Students use technology productivity tools to collaboratively construct completed products that represent quality work.

Standard 5: Technology research tools: Students use technology tools to locate, evaluate, and collect information from a variety of sources, process data, and report results.

Materials:

1. Census Information
2. Data Collection Chart
3. Computer
4. Microsoft Excel

Objectives:	Bloom's Taxonomy:	Assessment:
1. Collect, interpret, and record Census data	Knowledge, Comprehension	Census Data Worksheet
2. Depict Census data using tables and graphs	Application	Census Data Worksheet, Spreadsheet Chart and Table
3. Compare Census data for the US, Tennessee, and Shelby County.	Analysis	Interpreting Your Graphs and Table Workdsheet, Whole Class Discussion

TEACHING

Introduction:

Ask the students what a census is. Ask the students why a census is conducted. Take a census of the students in the class and record the information.

Teacher Procedures:	**Student Procedures:**
Prior to the Computer	
1. Distribute & discuss the Data Collection chart 2. Show students how to convert percentages to whole numbers.	1. Review & discuss the Data Collection chart 2. Develop a formula for converting percentages to whole numbers.
At the Computer	
1. Use the calculator to model converting a percentage to a whole number. 2. Display excel worksheet and guide students to create a Data Comparison table. 3. Model turning table information into a graph.	1. Convert percentages to whole numbers. 2. Develop a Data Comparison table. 3. Graph census information for US, Tennessee, and Shelby County.
After the Computer	
1. Ask students to make comparisons using tables and graphs. 2. Discuss results and methods.	1. Compare information on tables and graphs, and complete interpreting your graphs and table worksheet 2. Discuss results and methods.

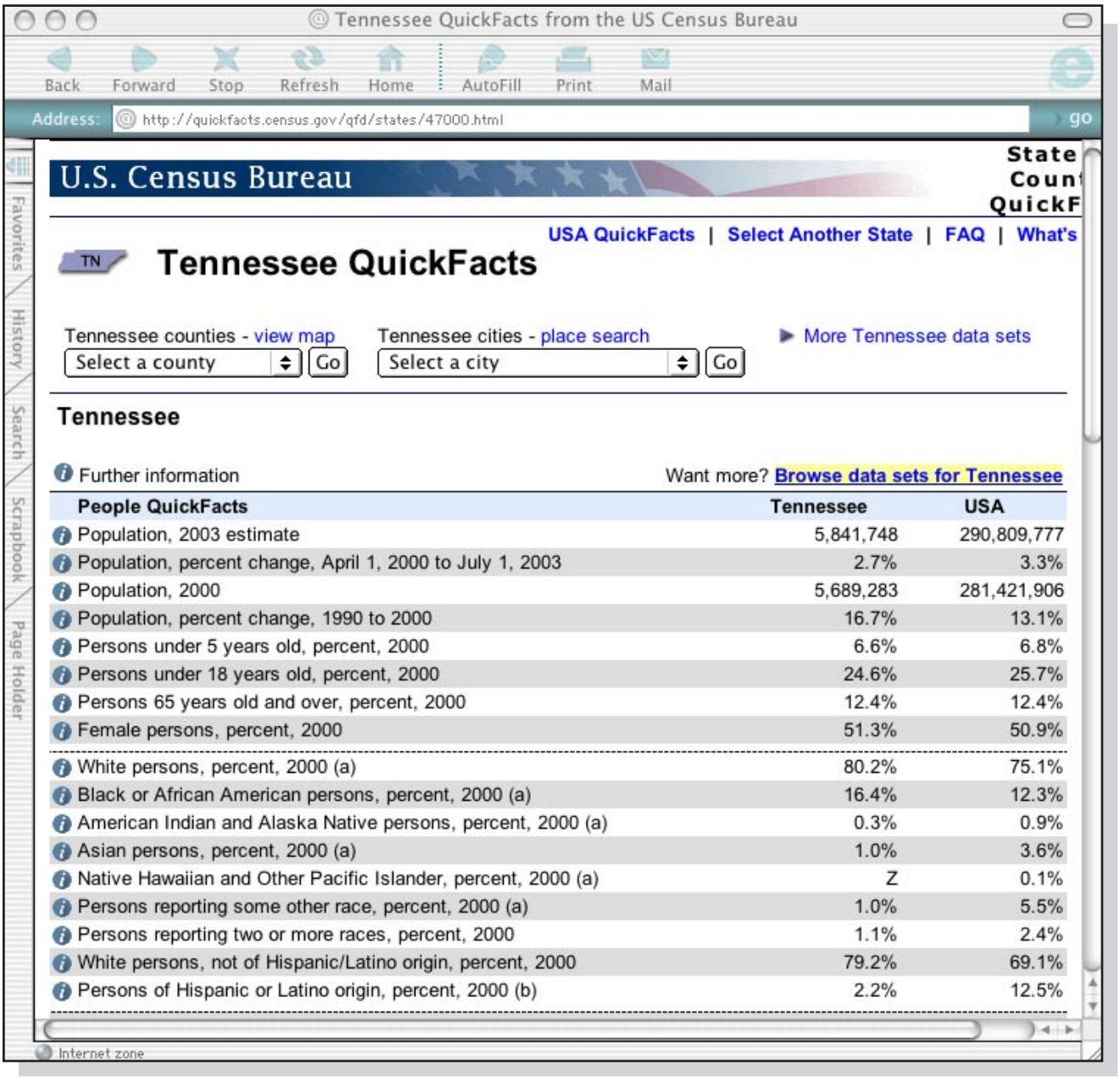
Resources:

1. U.S. Census Bureau Website (http://quickfacts.census.gov)
2. Memphis City Schools TLA website (http://www.memphis-schools.k12.tn.us/admin/tlapages/academyhome.html)

Assessment

CRITERIA	4	3	2	1
Spreadsheet				
Data and Labels (x 1)	All data is included, labeled and displayed in proper form.	Some data entries and/or labels are incorrect or unsupported.	Several data entries and/or labels are incorrect and unsupported.	Most data and/or labels are incorrect and unsupported.
Formulas & Calculations (x 2)	All calculations and formulas are correct.	Just one or two formula errors noted.	Several formula errors noted.	Most formulas are missing or incorrect.
Type of Graph Chosen (x 1)	Graph fits the data well and makes it easy to interpret.	Graph is adequate and does not distort the data, but interpretation of the data is somewhat difficult.	Graph distorts the data somewhat and interpretation of the data is somewhat difficult.	Graph seriously distorts the data making interpretation almost impossible.
Ease of Reading Graphs (x 1)	All titles, labels, and legends are present. Colors, fonts, and sizes are very attractive and easy to read.	Most titles, labels, and legends are present. Colors, fonts, and sizes are ok, easy to read.	Some titles, labels, and legends are present. Hard to read due to color, font, size or missing titles and legend.	No titles, labels, and legends are present.
Questions				
Question 1 (x 2)	Student accurately uses data from table and graphs to explain the difference among populations.	Student uses some data from table and graphs to explain the difference among populations.	Student uses minimal data from table and graphs to explain the difference among populations.	Student fails to uses data from table and graphs to explain the difference among populations.
Question 2 (x 2)	Student offers plausible reasons using social studies concepts for differences in populations.	Student offers some plausible reasons using social studies concepts for differences in populations.	Student offers minimal plausible reasons using social studies concepts for differences in populations.	Student fails to offer any plausible reason for causes in discrepancy using social studies concepts.
Question 3 (x 2)	Student offers two or more plausible reasons for causes in discrepancy with no misconception.	Student offers plausible reasons for causes in discrepancy with minor misconception.	Student offers one plausible reason for causes in discrepancy.	Student fails to offer any plausible reason for causes in discrepancy.

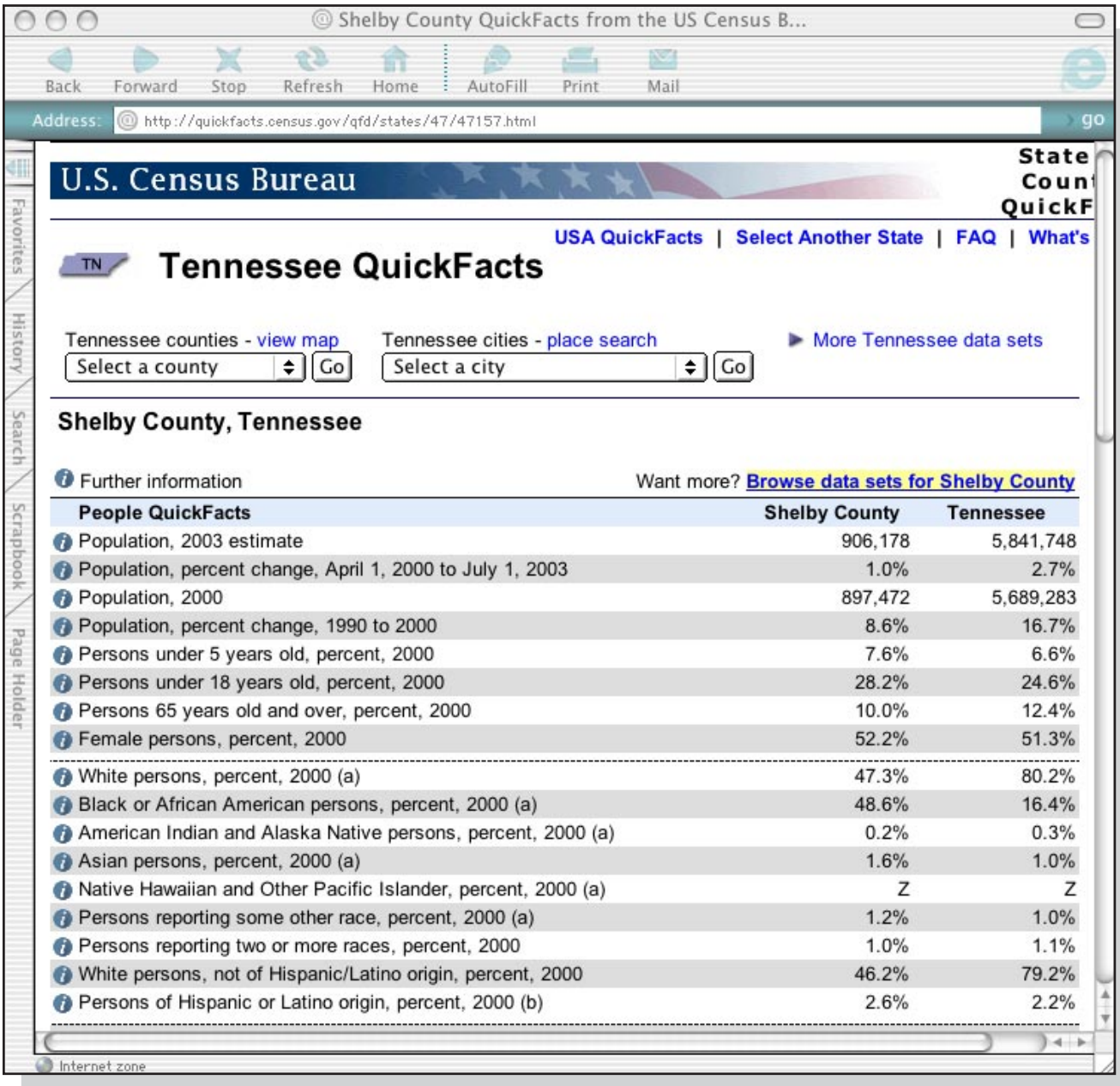
Census Information for U.S.A. and Tennessee



People QuickFacts	Tennessee	USA
Population, 2003 estimate	5,841,748	290,809,777
Population, percent change, April 1, 2000 to July 1, 2003	2.7%	3.3%
Population, 2000	5,689,283	281,421,906
Population, percent change, 1990 to 2000	16.7%	13.1%
Persons under 5 years old, percent, 2000	6.6%	6.8%
Persons under 18 years old, percent, 2000	24.6%	25.7%
Persons 65 years old and over, percent, 2000	12.4%	12.4%
Female persons, percent, 2000	51.3%	50.9%
White persons, percent, 2000 (a)	80.2%	75.1%
Black or African American persons, percent, 2000 (a)	16.4%	12.3%
American Indian and Alaska Native persons, percent, 2000 (a)	0.3%	0.9%
Asian persons, percent, 2000 (a)	1.0%	3.6%
Native Hawaiian and Other Pacific Islander, percent, 2000 (a)	Z	0.1%
Persons reporting some other race, percent, 2000 (a)	1.0%	5.5%
Persons reporting two or more races, percent, 2000	1.1%	2.4%
White persons, not of Hispanic/Latino origin, percent, 2000	79.2%	69.1%
Persons of Hispanic or Latino origin, percent, 2000 (b)	2.2%	12.5%

from http://quickfacts.census.gov

Census Information for Tennessee and Shelby County



People QuickFacts	Shelby County	Tennessee
Population, 2003 estimate	906,178	5,841,748
Population, percent change, April 1, 2000 to July 1, 2003	1.0%	2.7%
Population, 2000	897,472	5,689,283
Population, percent change, 1990 to 2000	8.6%	16.7%
Persons under 5 years old, percent, 2000	7.6%	6.6%
Persons under 18 years old, percent, 2000	28.2%	24.6%
Persons 65 years old and over, percent, 2000	10.0%	12.4%
Female persons, percent, 2000	52.2%	51.3%
White persons, percent, 2000 (a)	47.3%	80.2%
Black or African American persons, percent, 2000 (a)	48.6%	16.4%
American Indian and Alaska Native persons, percent, 2000 (a)	0.2%	0.3%
Asian persons, percent, 2000 (a)	1.6%	1.0%
Native Hawaiian and Other Pacific Islander, percent, 2000 (a)	Z	Z
Persons reporting some other race, percent, 2000 (a)	1.2%	1.0%
Persons reporting two or more races, percent, 2000	1.0%	1.1%
White persons, not of Hispanic/Latino origin, percent, 2000	46.2%	79.2%
Persons of Hispanic or Latino origin, percent, 2000 (b)	2.6%	2.2%

from http://quickfacts.census.gov

Data Comparison Table Worksheet Template

	A	B	C	D	E	F	G
1	**Census2000**	**US**		**Tennessee**		**Shelby Co.**	
2	Population	281,421,906		5,689,283		897,472	
3	Ethnicity	*Percentage*	*Number*	*Percentage*	*Number*	*Percentage*	*Number*
4	White	75.1%	C-4	80.2%	E-4	47.3%	G-4
5	African-American	12.3%	C-5	16.4%	E-5	48.6%	G-5
6	American Indian	0.9%	C-6	0.3%	E-6	0.2%	G-6
7	Asian-American	3.6%	C-7	1.0%	E-7	1.6%	G-7
8	Hawaiian/Pacific Islander	0.1%	C-8	0.0%	E-8	0.0%	G-8
9	Other race	5.5%	C-9	1.0%	E-9	1.2%	G-9
10	2 races or more	2.4%	C-10	1.1%	E-10	1.0%	G-10
11	Hispanic/Latino	12.5%	C-11	2.2%	E-11	2.6%	G-11
12		TOTAL	C-12	TOTAL	E-12	TOTAL	G-12

Write down the formula to get the answer for each column.

C-4: _____ E-4: _____ G-4: _____

C-5: _____ E-5: _____ G-5: _____

C-6: _____ E-6: _____ G-6: _____

C-7: _____ E-7: _____ G-7: _____

C-8: _____ E-8: _____ G-8: _____

C-9: _____ E-9: _____ G-9: _____

C-10: _____ E-10: _____ G-10: _____

C-11: _____ E-11: _____ G-11: _____

C-12: _____ E-12: _____ G-12: _____

Interpreting Your Graphs and Table Worksheet Template

1. How do the percentage of White, African American and Hispanic differ in the U.S.A., Tennessee, and Shelby Co.?

2. What are the possible reasons for the difference above?

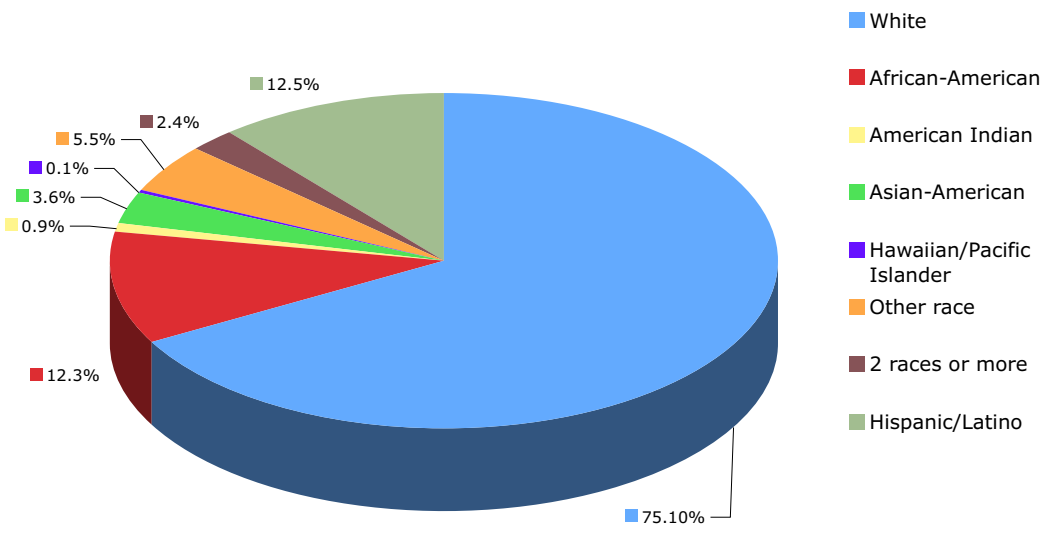
3. When summed up, the percentage column results are higher than 100%. What are the possible causes of this discrepancy?

STUDENT'S EXAMPLE

Data Comparison Table and Chart Sample

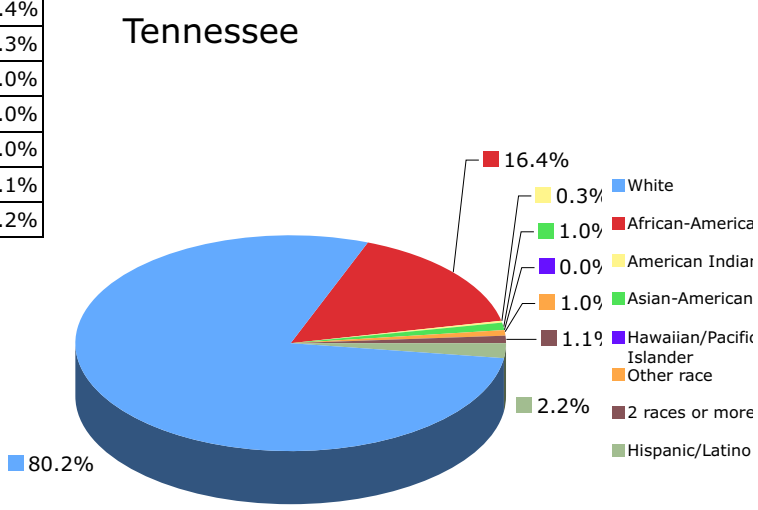
Census2000	US		Tennessee		Shelby Co.	
Population	281,421,906		5,689,283		897,472	
Ethnicity	*Percentage*	*Number*	*Percentage*	*Number*	*Percentage*	*Number*
White	75.10%	211,347,851	80.2%	4,562,805	47.3%	424,504
African-American	12.3%	34,614,894	16.4%	933,042	48.6%	436,171
American Indian	0.9%	2,532,797	0.3%	17,068	0.2%	1,795
Asian-American	3.6%	10,131,189	1.0%	56,893	1.6%	14,360
Hawaiian/Pacific Islander	0.1%	281,422	0.0%	0	0.0%	0
Other race	5.5%	15,478,205	1.0%	56,893	1.2%	10,770
2 races or more	2.4%	6,754,126	1.1%	62,582	1.0%	8,975
Hispanic/Latino	12.5%	35,177,738	2.2%	125,164	2.6%	23,334
	112.40%	316,318,222	102.20%	5,814,447	102.50%	919,909

Census2000	US
White	75.10%
African-American	12.3%
American Indian	0.9%
Asian-American	3.6%
Hawaiian/Pacific Islander	0.1%
Other race	5.5%
2 races or more	2.4%
Hispanic/Latino	12.5%

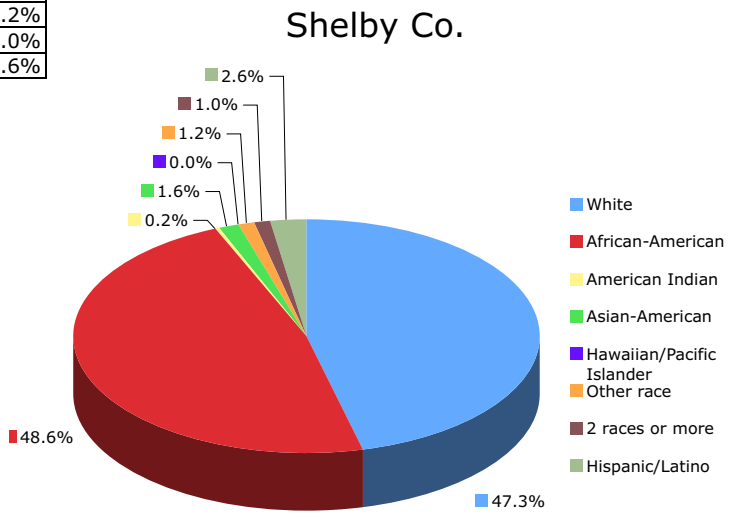


Data Comparison Table and Chart Sample

Census2000	Tennessee
White	80.2%
African-American	16.4%
American Indian	0.3%
Asian-American	1.0%
Hawaiian/Pacific Islander	0.0%
Other race	1.0%
2 races or more	1.1%
Hispanic/Latino	2.2%



Census2000	Shelby Co.
White	47.3%
African-American	48.6%
American Indian	0.2%
Asian-American	1.6%
Hawaiian/Pacific Islander	0.0%
Other race	1.2%
2 races or more	1.0%
Hispanic/Latino	2.6%



Sample Interpreting Your Graphs and Table

1. How do the percentage of White, African American and Hispanic differ in the U.S.A., Tennessee, and Shelby Co.?

   There are more white people in the United States, TN and Shelby County than other races. There are at least five times more White people than African-American or Hispanics in US and TN. However, Whites and African-Americans are at almost the same percentage in Shelby County. There are more African Americans than Hispanics in the U.S., TN and Shelby County. A higher % African Americans and Hispanics live in Shelby County than the state of Tennessee, but there is a lower % of White's in Shelby County compared to the rest of TN.

2. What are the possible reasons for the difference above?

   More minorities live in or around urban areas. Shelby County has a big city in the middle of it; Memphis. There are more African-Americans in Memphis. That is why there is a higher percentage of minorities in Shelby than TN. There is a smaller percentage of Hispanics in TN because TN is far away from South America where most Hispanics live.

3. When summed up, the percentage column results are higher than 100%. What are the possible causes of this discrepancy?

   Maybe some people are more than one race. So when they are filling out the census survey, they would mark more than one bubble. For example if a person had Hispanic and White heritage they would maybe mark both ethnicities. That makes two ethnicities for one person then making a percentage higher than 100%. Or may be the census people just rounded the numbers up because it's easier to count that way.

Sample Lesson Plans: SOCIAL STUDIES

Picture the Preamble

PLANNING

Topic: Social Studies

Time: 45 minutes for 2 days

Class: Grades 4-6

Content Standards addressed:

National Center for History in the Schools

STANDARD 2.I: The student comprehends a variety of historical sources; therefore the student is able to: **Draw upon the visual, literary, and musical sources** including: (a) photographs, paintings, cartoons, and architectural drawings; (b) novels, poetry, and plays; and, (c) folk, popular and classical music, to clarify, illustrate, or elaborate upon information presented in the historical narrative.

http://nchs.ucla.edu/standards/thinking5-12-2.html

Technology Standards addressed:

Standard 3: Technology productivity tools: Students use technology productivity tools to collaboratively construct completed products that represent quality work.

Standard 5: Technology research tools: Students use technology tools to locate, evaluate, and collect information from a variety of sources, process data, and report materials.
http://cnets.iste.org/students/s_stands.html

Materials:

1. Preamble Planning Sheet
2. Dictionary
3. Computer
4. Microsoft Word
5. Internet Access to:
   a. Online Preamble http://www.law.cornell.edu/constitution/constitution.preamble.html
   b. MS Clipart Gallery http://office.microsoft.com/clipart/default.aspx?lc=en-us
6. Pencil

Objectives:	Bloom's Taxonomy:	Assessment:
1. TLW select graphic images that represent each phrase of the Preamble to the US Constitution.	Comprehension	Preamble Rubric
2. TLW support the decision for selecting each graphic with a written rationale.	Knowledge, comprehension, analysis	Preamble Rubric
3. TLW write one or two paragraphs that demonstrates a clear understanding of the Preamble and what it means to her/him	Synthesis	Preamble Rubric

TEACHING

Introduction:

- Begin by displaying the Preamble to the Constitution of the United States on a large screen display, overhead, or whiteboard.
- Provide some brief background information about its purpose, authors, and when it was written.
- Give students a few minutes to silently read the Preamble; then have the class orally read the Preamble together.
- Follow this with a brief discussion pointing out that the Preamble may be a little difficult to understand because it is a fairly long and complex sentence.
- However, for the next two days, the students will be using pictures and images to make the Preamble easier to understand.

Teacher Procedures:	Student Procedures:
Prior to the Computer	
1. After the Introduction, distribute the Preamble Planning Sheets and dictionaries to students and ask them to briefly describe a possible picture or image that would illustrate each Preamble phrase and list key search words.	1. Students complete their Preamble Planning Sheet by briefly describing a picture or image for each Preamble phrase, using the dictionary when needed. 2. They then list two or three key words they can use to search for the images.

At the Computer

1. Have students open both MS Word and an Internet browser
2. Direct students to the Preamble website.
3. Direct students to the MS Clipart Gallery website
4. Monitor and assist as needed

1. Open MS Word and an Internet browser
2. Go to Preamble website and copy the Preamble
3. Go to MS Word and Paste the Preamble into a new document.
4. Add the following title: Picture the Preamble
5. Below the title, Insert a three-column 9-row table
6. Add the following column names: Preamble Phrase; Picture; Why Picture was Chosen
7. Cut and paste each Preamble phrase into the table.
8. Use key words to locate an image for the first phrase.
9. Use pull-down menu to copy the image
10. Go to Picture cell in the Word document
11. Paste the Picture
12. Write a brief rationale for why the picture represents the phrase
13. Save work
14. Repeat items 7-13 for the remaining phrases.
15. When all phrases are finished, correct any spelling errors
16. Print a copy.

After the Computer

1. Place students in groups of 3 to 4 students
2. Ask students to pass their Picture the Preamble work to the person on the right.
3. Students are to quietly review the work and take notes of the key similarities and differences, then pass the paper to the next person until students have reviewed all the papers in the group.
4. Give students 5 to 10 minutes to discuss the differences.
5. Have students individually write a reflection about what the Preamble means to them.

1. While in a group, students review each other's work and note differences and similarities between final documents.
2. Students discuss the different papers.
3. Students write one or two paragraphs describing what the Preamble means to them.

Assessment

PREAMBLE RUBRIC				
CRITERIA	**1**	**2**	**3**	**4**
Graphic images represent each phrase of the Preamble to the US Constitution.	Very few or none of the chosen graphics represent the concepts of their associated Preamble phrases.	Only a few of the chosen graphics clearly or somewhat clearly represent the concepts of their associated Preamble phrases.	Almost all of the chosen graphics clearly represent the concepts of their associated Preamble phrases.	All of the chosen graphics very clearly represent the concepts of their associated Preamble phrases.
Rationale for using the graphics	The rationale for very few or none of the chosen graphics demonstrates an appropriate representation of the concept.	The rationale for some of the chosen graphics demonstrates a fairly appropriate representation of the concept.	The rationale for almost all of the chosen graphics clearly demonstrates why the image is an appropriate representation of the concept.	The rationale for all of the chosen graphics very clearly demonstrates why the images were an appropriate representation of the concepts.
Reflections	The reflection does not demonstrate an understanding of the Preamble and/or what it means to the student.	The reflection demonstrates a somewhat vague understanding of the Preamble and what it means to the student.	The reflection demonstrates a somewhat clear understanding of the Preamble and what it means to the student.	The reflection demonstrates a clear understanding of the Preamble and what it means to the student.

Preamble Planning Sheet

Preamble Phrase	Describe a Picture that will represent this phrase	Key Search Word to find the picture.
We the People of the United States		
in Order to form a more perfect Union		
establish Justice		
insure domestic Tranquility		
provide for the common defense		
promote the general Welfare		
and secure the Blessings of Liberty to ourselves and our Posterity		
do ordain and establish this Constitution for the United States of America		

STUDENT'S EXAMPLE

Picture the Preamble (Sample)

Preamble Phrase	Preamble Phrase	Why picture was chosen
We the People of the United States		It represents multiple ethnicities with the American flag.
in Order to form a more perfect Union		The flag combined with the US map represent the states as a "Union"
establish Justice		Shows that Justice involves equality (scales), the law (book), and a justice system (the gavel)
insure domestic Tranquility		The dove symbolizes peace and tranquility.

Picture the Preamble (Sample)

Preamble Phrase	Preamble Phrase	Why picture was chosen
provide for the common defense		The pentagon is the defense center of the US and is dedicated to keeping all citizens safe.
promote the general Welfare		The people are happy because they enjoy the benefits of our country.
and secure the Blessings of Liberty to ourselves and our Posterity		The Statue of Liberty represents liberty to all people in the United States.
do ordain and establish this Constitution for the United States of America		Image shows what the Preamble to the constitution may have looked like when it was first written.

What the Preamble Means to Me
By Student Learner

Today, I learned about the Preamble to the United States Constitution. The Preamble showed me how lucky I am to live in the United States because it is truly a country dedicated to the people. The Preamble shows us that all the people in our country are united, including people of all races, all religions, and people from other countries. I also learned that our government protects the rights of all people who live here. We have freedom and the liberty to go to school and to do any type of work we want when we graduate.

Our country is also committed to keeping us safe by providing laws to protect us and also providing military protection.

I feel very proud to be an American.