The Human Form, Egyptian Style

Lesson plan based on **Amenemhet**

Analyze traditional ancient Egyptian depictions of the human body.

Skills and Focus: Art History, Discussion
Subject Area: Fine Arts
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 20 minutes, 40 minutes for discussion

Objectives

• Recognize the distinguishing characteristics of the ancient Egyptian method of depicting the human body.
• Explore how this method was used by artists throughout the history of ancient Egyptian art.
• Determine what the use of this method tells us about ancient Egyptian attitudes toward perfection, change, and progress.

Instructional Materials Needed

- Story: *What Does This Show?*
- Fragment

Activity

Step 1: While looking at the image of the fragment, discuss how ancient Egyptians depicted the human body, focusing on the head, facial features, and position of the torso and limbs. Point out those body parts that are depicted frontally and those that are depicted in profile.

Step 2: Divide students into small groups. Have each group use the library or the Internet to find three images of the human body from the 3,000 years of ancient Egyptian history. For each example, the group should record the image's original location, date, and a brief description of its meaning and purpose.

Step 3: In a subsequent class period, have each group display its three images and provide a brief oral introduction to each.

Step 4: Discuss the images with the class.

Critical Thinking Ask students to

• **compare** the images, focussing on how the images differ and how their artistic characteristics may have changed over time.
• **describe** how the ancient Egyptian commitment to the notion of the perfection of the world is demonstrated by the preservation of past artistic styles in the depiction of the human form.

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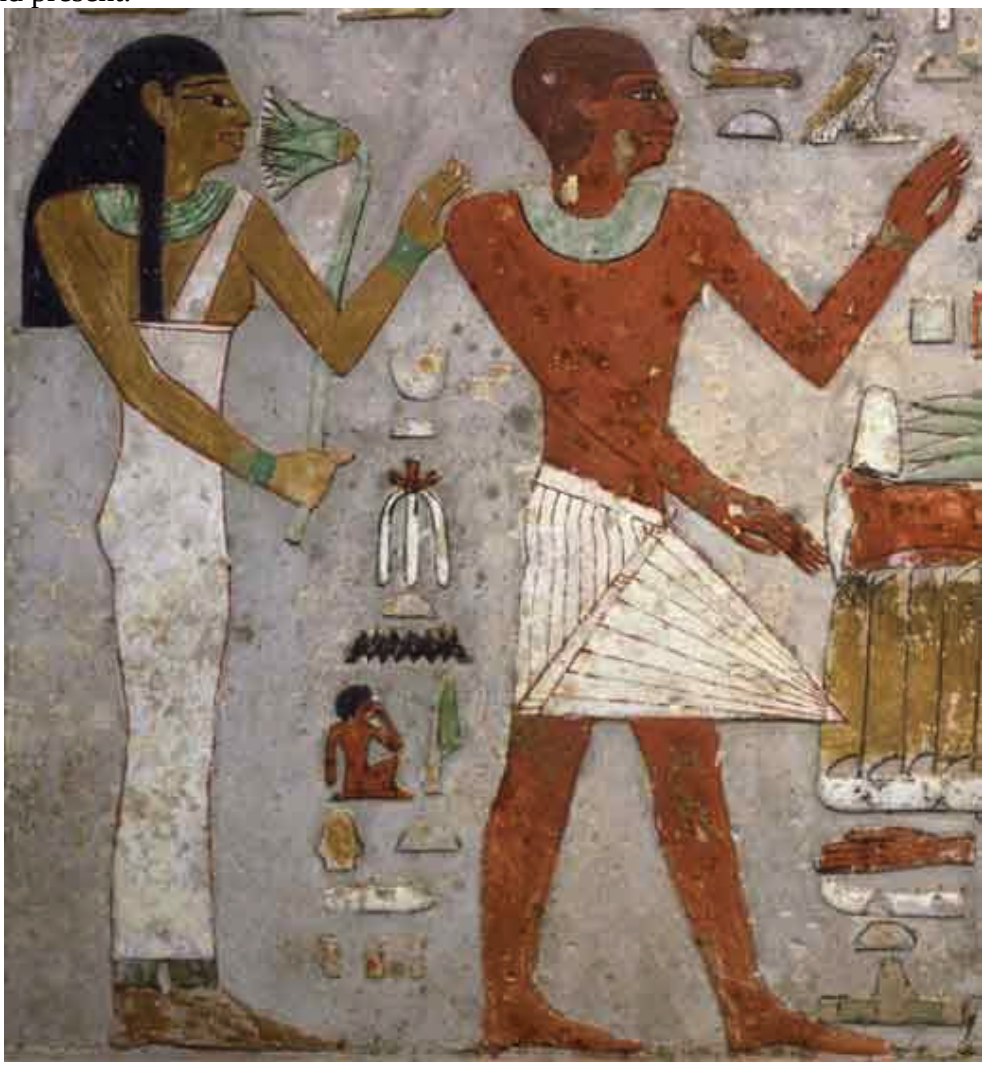
Goals
This activity meets **Illinois State Goal 27:** Understand the role of the arts in civilizations, past and present.



Wall Weight

Lesson plan based on **Amenemhet**

Calculate the weight of a limestone block in both metric and U.S. customary measurements.

Skills and Focus: Calculation, Problem Solving
Subject Area: Mathematics
Thematic Connection: Counting and Calculating

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Grade Level: Secondary School
Time Needed: 30 minutes

Objectives

- Make inferences by applying measurable ratios to known data.
- Convert from U.S. customary to metric measurement.

Instructional Materials Needed

Amenemhet Detail

Activity

Step 1: Explain the following known properties of the limestone block:

- length: 30.48 cm
- width: unknown
- thickness: 6.3 cm

Step 2: Using the printout of the wall fragment, encourage students to determine the width of the block.

Step 3: Assuming that the density of the limestone is 1,400kg/m3, have students determine the weight of the block.

Step 4: Finally, have students convert all of these measurements to U.S. customary measurements.

Goals

This activity meets **Illinois State Goal 8:** Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

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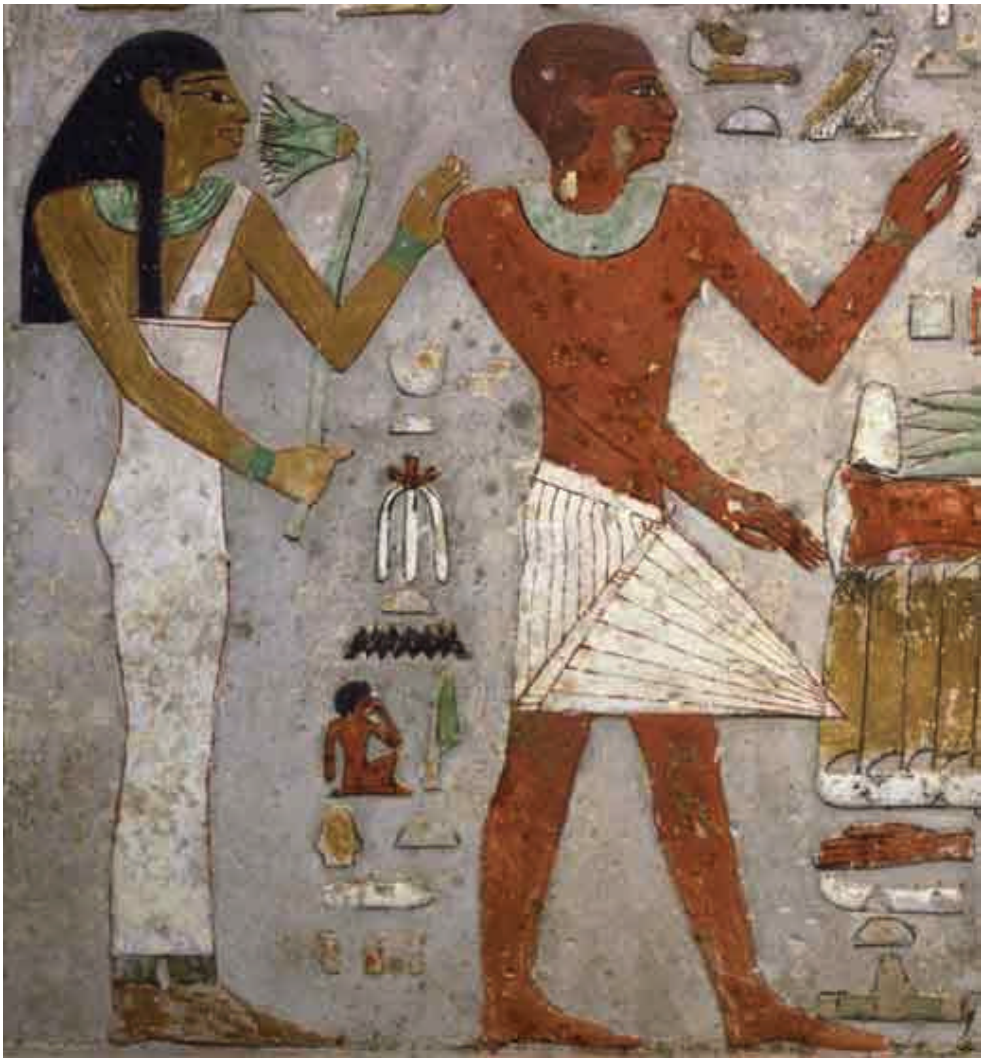

Carving Stone with Copper

Lesson plan based on **Amenemhet**

Simulate and evaluate the process of carving stone with copper tools.

Skills and Focus: Physics
Subject Area: Science
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 60 minutes

Objectives

- Understand the properties of copper as a material for making tools.

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• Understand the properties of different chisel points.
• Gain practice taking notes on qualitative and quantitative data.

Instructional Materials Needed

- Story: *How Was This Made?*
- Copper bars (6” in length, 1/4” thick)
- Hammers and one or two anvils
- Marble or limestone slabs (rough surface texture)
- Notebooks

Activity

Caution: All students must wear safety goggles throughout this activity.

Step 1: Each student (or group) should shape the tip of a copper bar into a chisel form by hammering against the anvil. Encourage students to form different tip shapes: points, thin blades, or thick blades.

Step 2: Have students use the chisels to chip away at the stone slabs, trying to make a 2” x 2” x 1/4” square and a 3” x 1/4” straight line. Each student or group should take notes about how long it takes a chisel to deform or become dull enough that it must be reshaped. These notes should include measurements of the original width of the blade, the number of blows it takes to deform the blade, and the number of times the blade must be reshaped to create the specified carvings.

Step 3: Finally, discuss the activity with the class.

Critical Thinking Ask students to

• **explain** whether narrow blades become dull more quickly than wide blades.
• **conclude** whether the reshaping of the blades makes them harder or more brittle.
• **assess** how easy or difficult it must have been for the ancient Egyptians to cut stone with copper tools. Students should use the data they collected to support their conclusions.

Goals

This activity meets **Illinois State Goal 13:** Have a working knowledge of the relationships among science, technology, and society.

Burial Practices and Memorials

Lesson plan based on **Amenemhet**

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Compare and contrast burial practices in ancient Egypt, the former Soviet Union, and the United States.

Skills and Focus: Oral Presentation, Discussion, Cultural Comparisons, Writing
Subject Area: Social Science
Thematic Connection: Connecting Past and Present, Comparing Cultures
Grade Level: Secondary School
Time Needed: 45-90 minutes

Objectives

• Describe the treatment of the dead in ancient Egypt.
• Compare the treatment of the dead in ancient Egypt to that of contemporary societies.

Instructional Materials Needed

- Online Stories: *What Does This Show?*, *How Was This Used?*, and *How Were Mummies Made?*
- Resources:
  • Information about Lenin: http://www.aha.ru/~mausoleu and http://128.103.251.49/S97Books/S97.Catalog/lenin.lives.html
  • Encyclopaedia Britannica Online: http://search.eb.com

Activity

In ancient Egypt, a tomb was a monument that not only protected the mummified remains, but also ensured that the person would be remembered. Divide the class into two groups. Each group should research the following issues and develop a presentation in which they:

• Compare and contrast the ancient Egyptian practice of mummifying the dead and constructing and decorating tombs to the former Soviet Union's preservation of Lenin's body in Moscow's Red Square.
• Discuss how both of these examples compare to contemporary American treatment of the dead, such as burials, funerals, cremations, and memorials.
• Discuss how these practices serve the needs of the living in each of the three cultures.

Goals

This activity meets **Illinois State Goal 16**: Understand and analyze events, trends, individuals and movements shaping the history of Illinois, the United States, and other nations.

An Ancient Egyptian Journal Entry

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Lesson plan based on **Amenemhet**

Describe everyday life in ancient Egypt by writing an entry in the journal of an ancient Egyptian man or woman.

Skills and Focus: Writing, Research, Online Research
Subject Area: English Language Arts
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: Two hours

Objectives

• Use the information presented in the movie *What Does This Show?* to write a journal entry describing a day in the life of Amenemhet or Hemet.

• Convey a clear sense of life in ancient Egypt by using appropriate action verbs and sensory details as well as historically accurate details about life in ancient Egypt.

• Demonstrate understanding of "voice" by writing a journal entry that suggests authorship by an ancient Egyptian.

Instructional Materials Needed

- Online Story: *What Does This Show?* Amenemhet.Eng.2.storytranscript.html
- Print Resources:

• , Anita. *Focus on Ancient Egyptians.* New York: Gloucester Press, 1993. Pp.18-23.

• Grant, Neil. *Spotlights: The Egyptians*. New York: Oxford University Press, 1996. Pp.24-25, 32-35.

• Harris, Geraldine. *Cultural Atlas for Young People: Ancient Egypt*. New York: Facts On File, Inc., 1990. Pp. 26-27.

Online Resources:

• The University of Memphis Institute of Egyptian Art and Archaeology: http://www.memphis.edu/egypt/main.html

• The Ancient Egypt Site: http://www.geocities.com/~amenhotep

Activity

Step 1: Students should watch the story *What Does This Show?*, paying close attention to the details of Amenemhet's and Hemet's lives. Encourage students to take notes on the visual appearance of clothing, food, and people.

Step 2: Distribute the transcript and review the descriptions that were included about the Egyptian couple's professions, clothing, diet, and life together. Encourage the students to use the print and online resources to supplement the information conveyed in the story.

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Step 3: Have students write journal entries describing a day in the life of Amenemhet or Hemet. Encourage students to pattern their entries after the way they write in their own journals. Entries should include vivid action verbs and sensory details and should suggest what life was like in ancient Egypt, from rising in the morning to retiring at night.

Step 4: As students write, challenge them to find the "voice" of Amenemhet and Hemet. Be available in the classroom as they work, encouraging them to avoid modern expressions. Students should work to place themselves in the "shoes" of the character, developing a personality, feelings, and attitude that expresses the individual.

Goals

This activity meets **Illinois State Goal 1:** Read for understanding and fluency.

This activity meets **Illinois State Goal 3:** Write to communicate for a variety of purposes.

Art on the Move

Lesson plan based on **Model Boat**

Research, analyze, and compare artworks that depict transportation.

Skills and Focus: Art History, Cultural Comparisons, Writing
Subject Area: Fine Arts
Thematic Connection: Transportation, Comparing Cultures
Grade Level: Secondary School
Time Needed: 60 minutes

Objectives

• Analyze or discuss how the model boat reflects ancient Egyptian daily life and the afterlife, focusing particularly on transportation.
• Investigate how technological changes are reflected in art and society by researching the ideas of travel and transportation in the art of other cultures.

Instructional Materials Needed

· Stories: *Boats in Ancient Egypt* and *Models as Substitutes*

Activity

Step 1: Discuss the ancient Egyptian practice of placing objects like the model boat in tombs for use in the afterlife. Boats were an integral part of daily life as

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the main mode of transportation, and thus would be important for people to take with them to the afterlife.

Step 2: The ideas of motion, transportation, and travel have fascinated artists of many cultures and times. Ask students to conduct individual or group research to compare and contrast the Model Boat to one or more of the following images in the Art Institute collections:

- Utagawa (Ando) Hiroshige, *Branch Road at Motomachi, Totsuka,* 1833
- Claude Monet, *Arrival of the Normandy Train, Gare Saint-Lazare,* 1877
- Walter Ellison, *Train Station,* 1936
- Constantin Brancusi, *Golden Bird,* c. 1922

For more information, consult The Art Institute of Chicago's Teacher Packet, Art on the Move, *1996.*

Goals

This activity meets **Illinois State Goal 27:** Understand the role of the arts in civilizations, past and present.

A Trip Down the Nile

Lesson plan based on **Model Boat**

Research ancient and contemporary Egypt and build a Web site that shows the cultural importance of selected towns, monuments, and sights along the Nile River.

Skills and Focus: Research, Writing, Illustrating, Geography, Web Development
Subject Area: English Language Arts
Thematic Connection: Transportation
Grade Level: Secondary School
Time Needed: Three 50-minute class periods

Objectives

- Research the upper and lower kingdoms of Egypt and some of the various towns, monuments, and sights along the Nile.
- Work in small groups to explore in detail specific places along the Nile.
- Understand the cultural importance of different places along the Nile through the creation of an interactive Web site.

Instructional Materials Needed

- Stories: *Boats in Ancient Egypt* and *Egyptian Culture*
- Egypt map

Print resources on ancient and modern Egypt:

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• Ganeri, Anita. *Focus on Ancient Egyptians.* New York: Gloucester Press, 1993. Pp. 4-5
• Harris, Geraldine. *Cultural Atlas for Young People: Ancient Egypt*. New York: Facts On File, Inc., 1990. (maps throughout).
• Bentley IV, John J. *Egypt Guide.* Cold Spring Harbor, NY: Open Road Publishing, 1998.
• *Exploring Egypt*, 2nd ed. New York: Fodor's Travel Publications, 1998.
• Haag, Michael. *Egypt,* 2nd ed. London: Cadogan Books, 1998.
• *Insight Guide: Egypt*, 5th ed. London: Insight Guides, APA Publications, 1998.
• *Knopf Guides: Egypt*. New York: Alfred A. Knopf, Inc., 1995.
Richardson, Dan. *Egypt: The Rough Guide*, 3rd ed. London: Rough Guides, Inc., 1996.

Activity

Step 1:. Divide students into groups of two or three. Each group should use print and online resources to decide which sites they wish to explore. Possibilities include but are not limited to Rosetta, Memphis, Giza, Saqqara, Dendera, Valley of the Kings, Aswan, Thebes, and Cairo. Research should answer questions like these:

- Why is this place important?
- When was it constructed or founded?
- What are the most interesting aspects of this place?
- Is this place part of ancient or modern Egypt?
- If the place is a remnant of ancient Egyptian culture, what happened there?
- What historical figures are associated with it?
- What kinds of Egyptian art and artifacts can be seen there?
- If the place is part of modern Egypt, why was it constructed?
- How important is the place in current life? Do people live in, work in, or visit this place?

Step 2: When each group has chosen a place, students should begin building their Web pages by gathering pictures and using their research to write captions for the pictures. Pictures may come from other Web sites or be scanned from books and magazines. Groups should work together to include clickable maps that will highlight each group's place and take users to the appropriate pages.

Step 3: Working together, groups should plan the structure of the Web site, assemble each group's pages, and build the site. When the site is complete, make it available to all students at the school as a resource for information on ancient and modern Egypt.

Goals

This activity meets **Illinois State Goal 1**: Read for understanding and fluency.

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This activity meets **Illinois State Goal 3:** Write to communicate for a variety of purposes.

Building a Boat

Lesson plan based on **Model Boat**

Estimate and compare the size and quantity of wood needed to make an ancient Egyptian boat using human rowers as units of measure.

Skills and Focus: Calculation, Measuring
Subject Area: Mathematics
Thematic Connection: Counting and Calculating
Grade Level: Secondary School
Time Needed: 50 minutes

Objectives

- Use numerical ratios to measure an object of unknown size using an object of known size as a measuring tool.

Instructional Materials Needed

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- Boat Image
- Xray Image
- Rulers, paper, pencils, colored pencils

Activity

Step 1: Distribute copies of the model boat to each student. Have students measure the length of the boat and the distance from the hips to the top of the head of each rower.

Step 2: Distribute a copy of the mummy's x–ray to each student. Students should measure the height of the mummy with the ruler and the height of the mummy's torso and head. We know that the mummy was 5'5" tall. Use the ratio of torso and head: total height of the mummy to estimate the distance from his hips to the top of his head.

Step 3: Assuming the height derived in step 2 is the same as the height of the rowers, students can use this height to estimate the total length, width and depth of the boat.

Step 4: Determine the amount of wood that would be needed to build the boat, assuming that 6.3 meters of wood are needed for every 10 feet of the boat's length.

Goals

This activity meets **Illinois State Goal 6:** Demonstrate and apply a knowledge and sense of numbers, including basic arithmetic operations, number patterns, ratios, and proportions.

This activity meets **Illinois State Goal 7:** Estimate, make, and use measurements of objects, quantities, and relationships and determine acceptable levels of accuracy.

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Travel the Nile

Lesson plan based on **Model Boat**

Calculate travel times along the Nile River under different conditions using an ancient Egyptian boat and alternative forms of modern–day transportation.

Skills and Focus: Calculation, Problem Solving
Subject Area: Science
Thematic Connection: Geography
Grade Level: Secondary School
Time Needed: 60 minutes

Objectives

- Solve an algebraic problem.
- Calculate the amount of time it would take to sail the length of the Nile under different conditions.

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• Explore the impact of technology on travel along the Nile River.

Instructional Materials Needed

- Story: *Boats in Ancient Egypt*
- Cleo Map

Activity

Step 1: After watching *Boats in Ancient Egypt* with the students (making sure they pay close attention to the distance the Nile River travels through Egypt), have students determine how many days it would take to travel the length of the Nile through Egypt, sailing 12 hours a day and assuming that the boat travels at a speed of 5 mph in still water.

Step 2: Assuming the waters of the Nile flow south to north (S-N) at 4 mph, calculate how long it would take to travel the same distance going 1) S-N and 2) N-S. If the S-N wind can increase the speed of the boat by an additional 6 mph (using a sail), calculate the S-N travel time. What is the difference between the N-S and the S-N travel times?

Step 3: Using the map of Egypt, choose two destination points along the Nile. Calculate the time it would take to travel at a speed of 5 mph, round trip, by boat between those points. Have students predict the time it would take to travel the same distance by modern ship, car, or train. Calculate how long it would take by car or train by using an algebraic equation.

Critical Thinking Ask students to

• **assess** how accurate their predictions were.
• **explain** the advantages and disadvantages of each method of transportation in ancient Egypt and today.
• **draw conclusions** about the way twentieth-century technology has changed the way people travel the Nile.

Goals

This activity meets **Illinois State Goal 11**: Have a working knowledge of the processes of scientific inquiry and technological design to investigate questions, conduct experiments, and solve problems.

This activity meets **Illinois State Goal 13**: Have a working knowledge of the relationships among science, technology, and society in historical and contemporary contexts.

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A River Runs Through It

Lesson plan based on **Model Boat**

Use timelines to research, compare, and illustrate the impact and influence of the Nile and Chicago rivers on the development of ancient Egypt and the city of Chicago.

Skills and Focus: Hands-on, Cultural Comparisons, Geography, Writing
Subject Area: Social Science
Thematic Connection: Geography, Comparing Cultures
Grade Level: Secondary School
Time Needed: 90 minutes

Objectives

- Explain ways in which geographic factors influenced the development of ancient Egypt and the city of Chicago.
- Document and explain ways in which the Chicago River and the city of Chicago have been changed by natural and human factors.

Instructional Materials Needed

Story: *Boats in Ancient Egypt*
Cleo Timeline
18 x 24-inch poster board (one for each student pair)
Online resources:
• Information about the Chicago River (Friends of the Chicago River):

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http://www.chicagoriver.org/cr/index.html
• Images of Chicago from Chicago Historical Society:
http://www.chicagohistory.org/index2.html
• Other Chicago historical links to images:
http://www.suba.com/~scottn/explore/links/links2.htm
Print Resource:
• Mayer, Harold and Richard Wade. *Chicago: Growth of a Metropolis*. Chicago: University of Chicago Press, 1969.

Activity

Step 1: Divide students into two-person groups. Each group will use the above resources to:

- research the impact of the Nile on the development of ancient Egypt.
- research the impact of the Chicago River on the development of Chicago.
- compare the two rivers and their respective importance to each region.
- document key events in the development of each region that occurred specifically as a result of the existence of each respective river.
- Document environmental issues pertinent to the Chicago River

Step 2: Ask each group to use the poster board to create two timelines documenting each region's development and progress thanks to their life-giving rivers. To illustrate each timeline, have students use images from *Cleopatra* and from the online resources about Chicago.

Step 3: Have students do research in the library or online on primary source accounts of the importance of each river to its respective time and place. Students should keep in mind that Egyptian accounts may come in visual as well as textual form. Students should then share their findings with the class. Have students look for accounts of changes in the Chicago River today (new river walls, etc.).

Goals

This activity meets **Illinois State Goal 17**: Demonstrate a knowledge of world geography, as well as an understanding of the effects of geography on society, with an emphasis on the United States.

Life After Death

Lesson plan based on **Mummy Case**

Explore ancient Egyptian beliefs about death and the afterlife by observing and interpreting the design and illustration of a mummy case.

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Skills and Focus: Art History, Discussion
Subject Area: Fine Arts
Thematic Connection: Signs and Symbols, The Afterlife
Grade level: Secondary School
Time Needed: 20 minutes

Objectives

- Identify tools, skills, and processes used to make a mummy case.
- Understand and appreciate the decorative elements of the mummy case.
- Analyze and evaluate how the production of the mummy case communicates ancient Egyptian ideas about death and the afterlife.

Instructional Materials Needed

Stories: *Who Is Inside This Case?* and *What Is on This Mummy Case?*
Mummy Case

Activity

Step 1: While watching the stories, each student should take careful notes on the different types of tools, skills, and processes required to create the case.

Step 2: Discuss the students' findings and create a list on the chalkboard or an overhead projector.

Step 3: Have students view the story again. This time they should take notes on Egyptian beliefs about death and the afterlife, and create a second list based on their findings. This list also should include the decorative elements that illustrate these beliefs.

Step 4: Ask students to spend some time studying each list.

Critical Thinking Ask students to

- **explain** how the ancient Egyptians' belief in death and the afterlife was reflected in their culture.
- **recognize** the role mummy cases played in communicating these beliefs.
- **describe** how the artisans used their tools, skills, and processes to convey these beliefs.
- **evaluate** how successful the artisans were in conveying their beliefs.

Goals

This activity meets **Illinois State Goal 26:** Through creating and performing, understand how works of art are produced.

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Prayers for Paankhenamun

Lesson plan based on **Mummy Case**

Find out about key attributes, characteristics, and roles of ancient Egyptian gods and goddesses by writing and presenting a group dialogue between ancient Egyptian deities and the spirit of a deceased Egyptian.

Skills and Focus: Research, Online Research, Writing
Subject Area: English Language Arts
Thematic Connection: The Afterlife, Myths and Legends
Grade Level: Secondary School
Time Needed: Two 50-minute class periods

Objectives

- Work in groups of two to research one of the six Egyptian gods or goddesses of the afterlife.

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• Recognize images of this god or goddess according to his or her physical attributes.
• Understand the symbols associated with and the role played by that god or goddess in every Egyptian's journey from this world into the afterlife.
• Demonstrate understanding by writing a dialogue between the god or goddess and the spirit of Paankhenamun that would have taken place on Paankhenamun's way to the afterlife.

Instructional Materials Needed

Story: *What Is on This Mummy Case?*
Mummy Case
For additional information about the gods:
• http://members.aol.com/egyptart/mytho.html (click on "Glossary of Deities")
• Horus, Osiris, Anubis:
http://angelfire.com/ca/pye/gods.html
• Horus, Osiris, Isis:
http://touregypt.net/gods1.htm

Activity

Step 1: Before watching the story *What Is on This Mummy Case?* (or before showing it a second time), divide students into groups of two or three and assign each group to one of the following gods or goddesses of the afterlife: Anubis, Horus, Osiris, Sons of Horus, Isis, and Nephthys. Students should take notes about their respective god or goddess as they watch the story.

Step 2: Using the resources suggested in the **Instructional Materials Needed** section, allow the students time for Internet or book research on their deity. They should find out the following information about their god or goddess:

- How can this god or goddess be recognized? Does he or she have any distinguishing physical features?
- What was the role of this god or goddess in an Egyptian's journey to the afterlife? (Consider how this god or goddess would have been helpful to Paankhenamun, the man in the mummy case.)
- What symbols or attributes are associated with this god or goddess?
- What is the significance of the god's or goddess's name?

Step 3: Using the information gathered in their research, each group will write a brief dialogue between the god or goddess and the spirit of Paankhenamun that would have taken place on Paankhenamun's way to the afterlife. The answers to the above questions should be embedded within this document. Encourage students to imagine a personality for the god or goddess and for Paankhenamun himself.

Step 4: During a subsequent class period, students can present their dialogues to the entire class in a dramatic fashion, with one student playing the role of the god

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or goddess (demonstrating the attributes, role, and personality researched the day before), and the other playing Paankhenamun.

Goals

This activity meets **Illinois State Goal 2**: Understand explicit and implicit meaning in literature representing individual, community, national, world, and historical perspectives.

This activity meets **Illinois State Goal 3**: Write to communicate for a variety of purposes.

This activity meets **Illinois State Goal 4**: Listen and speak effectively in a variety of situations.

Measuring a Mummy Case

Lesson plan based on **Mummy Case**

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Calculate the volume of the mummy case using ancient Egyptian, U.S. customary, and metric measurements.

Skills and Focus: Measuring, Calculation
Subject Area: Mathematics
Thematic Connection: Counting and Calculating
Grade Level: Secondary School
Time Needed: 45 minutes

Objectives

- **Practice measuring in different systems.**
- Convert between different measuring systems.
- Consider why conversion ratios between lengths and volumes are different.

Instructional Materials Needed

Mummy Case
Ruler divided into 1/8" units or millimeters

Activity

Step 1: Have students estimate the width and depth of the mummy case of Paankhenamun, assuming that the case is 67" in length. Convert the dimensions to cubits (1 cubit = 21").

Step 2: Ask students to determine the volume of the mummy case in cubits.

Step 3: Students should convert the volume of the mummy case in cubits3 to meters3 and ft3. Are the results surprising? Determine decimal conversions between cubits and feet, then cubits and meters.

Goals

This activity meets **Illinois State Goal 6:** Demonstrate and apply a knowledge and sense of numbers, including basic arithmetic operations, number patterns, ratios, and proportions.

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Building a Body: Scale, Proportion, and Ratio

Lesson plan based on **Mummy Case**

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Measure, analyze, and compare the ancient Egyptian canon of proportions using a mummy, painted images, and photographs of people today.

Skills and Focus: Problem Solving
Subject Area: Science
Thematic Connection: Comparing Cultures
Grade Level: Secondary School
Time Needed: 90 minutes

Objectives

- Introduce students to hypothesis definition and testing.
- Introduce the concepts of distortion and abstraction in representation.
- Demonstrate the anatomical similarities between ancient Egyptians and modern humans.

Instructional Materials Needed

Mummy Case
Mummy Case Detail
Xray Image
Full–length photographs of contemporary people
A ruler accurate to 1/8" or 1 mm.
Calculators, if needed

Activity

Step 1: Egyptian artists represented people using a strict ratio for the size of body parts called a canon of proportions. At the time the Mummy Case of Paankhenamun was made, the canon of proportions divided the body into 18 units of identical size. The torso and head were typically represented as 7 units in height and the lower body (from the waist down) as 11 units.

Step 2: Have students divide the images of Isis and Osiris into 18 identical units by measuring each figure and dividing the total height by 18. Mark the 18 units on the printout with a pencil. Counting up from the bottom, decide whether the canon of proportions (11 units from the bottom of the feet to the waist, 7 units from the waist to the top of the head) was followed.

Step 3: Ask students to collect pictures of contemporary people from newspapers and magazines and apply the same system to them. In order to make measurement easier, calculate upper and lower body ratios to total height in decimal values. Determine the averages of the contemporary human images. Compare the results to those for the Egyptian images, using the decimal values for 7/18 (upper body) and 11/18 (lower body). Discuss the different ratios seen in the contemporary photographs versus the painted images.

Step 4: Conduct the same experiment on the x–ray image of Paankhenamun's mummy.

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Step 5: Discuss the findings with students.

Critical Thinking Ask students to

- **conclude** whether the people in the contemporary photographs match the proportions of the Egyptian images.
- **describe** how did they differed.
- **explain** whether the proportions of the mummy are closer to those of modern humans or to the painted images on the mummy case.

Goals

This activity meets **Illinois State Goal 11:** Have a working knowledge of the processes of scientific inquiry and technological design to investigate questions, conduct experiments, and solve problems.

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A Tale of Two Cities

Lesson plan based on **Mummy Case**

Research and compare Thebes to your hometown to understand how a city's geography, economy, climate, and culture affect its inhabitants.

Skills and Focus: Geography, Cultural Comparisons, Discussion
Subject Area: Social Science
Thematic Connection: Geography, Comparing Cultures
Grade Level: Secondary
Time Needed: 40-90 minutes

Objectives

• Understand key characteristics of the ancient Egyptian city of Thebes and how geographic, climatic, and technological features of a city affect its inhabitants.

Instructional Materials Needed

Egypt Map
Secondary source material on Thebes (e.g.: CD-ROM, encyclopedia)
Internet resources on Thebes:
• http://www.Kv5.com/intro.html

Activity

Information on the mummy case indicates that Paankhenamun lived in the city of Thebes. Locate it on a map of Egypt. Ask students to use print and electronic

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resources to investigate various aspects of this city in ancient Egypt (geography, economy, culture), and then to compare those features with those of the local community. Discuss how geography, climate, and technology affect the lifestyles of a place's inhabitants.

Goals

This activity meets **Illinois State Goal 17**: Demonstrate a knowledge of world geography, as well as an understanding of the effects of geography on society.

Reflecting Culture Through Coins

Lesson plan based on **Alexander Coin**

Research and recreate coins from ancient civilizations to determine how the imagery reflects the cultures which originally made them.

Skills and Focus: Studio, Art History
Subject Area: Fine Arts
Thematic Connection: Money**,** Signs and Symbols
Grade Level: Secondary School
Time Needed: 80 minutes

Objective

- Recognize how images on the Alexander coin reflect his rule.
- Discover through research coins from other areas and periods.

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• Recreate an ancient coin using tooling foil.
• Analyze how the recreated coin reflects the society that originally made it.

Instructional Materials Needed

Stories: *Who Was Alexander?* and *Coins in the Greek World*
Coin Template
Pencils or ball point pens
Scissors
Tooling foil circles cut the same size as the coin template
Poster board circles cut the same size as the coin template
Glue
Print Resources:
Ancient Art at The Art Institute of Chicago. Museum Studies, vol. 20, no. 1, 1994.
Online Resources:
• The Perseus Project:
http://www.perseus.tufts.edu/art&arch.html [click on Coin Catalog]
• Edward J. Waddell, Ltd., Ancient Coin Specialists:
http://www.coin.com

Activity

Step 1: Discuss how the images on the Alexander coin reflect his rule.

Step 2: Have students conduct research in the library or on the Internet to find coin(s) from other ancient cultures to reproduce. They should record the culture, dates, historical context, and images depicted for their presentation.

Step 3: Students should sketch their designs with pencil on coin templates. Remind them that the final image will appear in reverse.

Step 4: Have students cut out a template and lay on one circle of foil. Using a dull pencil or ball point pen, they should carefully trace the design while applying steady pressure with the pen or pencil. Have students experiment with pressure applied to produce different effects. Repeat with the other design.

Step 5: Students should glue the foil circles onto each side of one poster board circle.

Step 6: Display the coins along with each students' written analysis of how the coin reflects the society that originally made it.

Goals

This activity meets **Illinois State Goal 26:** Through creating and performing, understand how works of art are produced.

This activity meets **Illinois State Goal 27:** Understand the role of the arts in civilizations, past and present.

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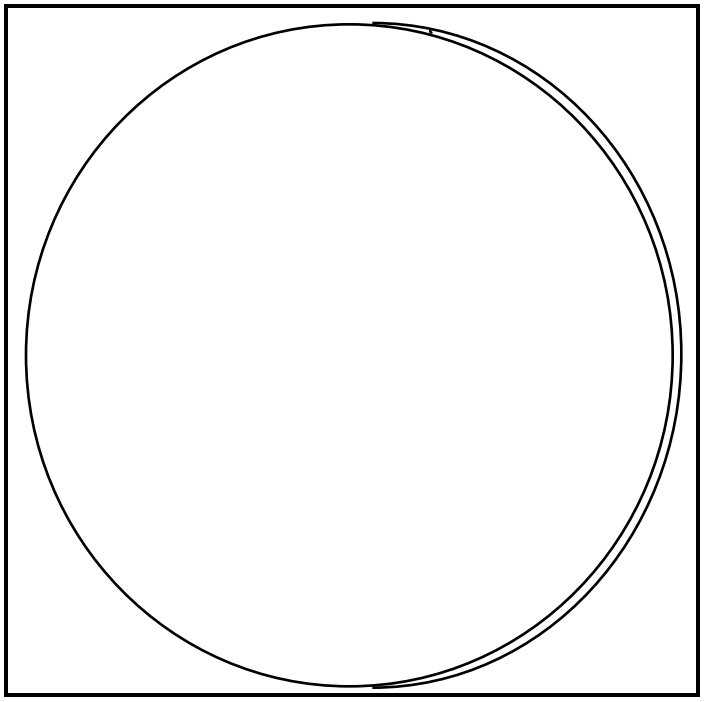

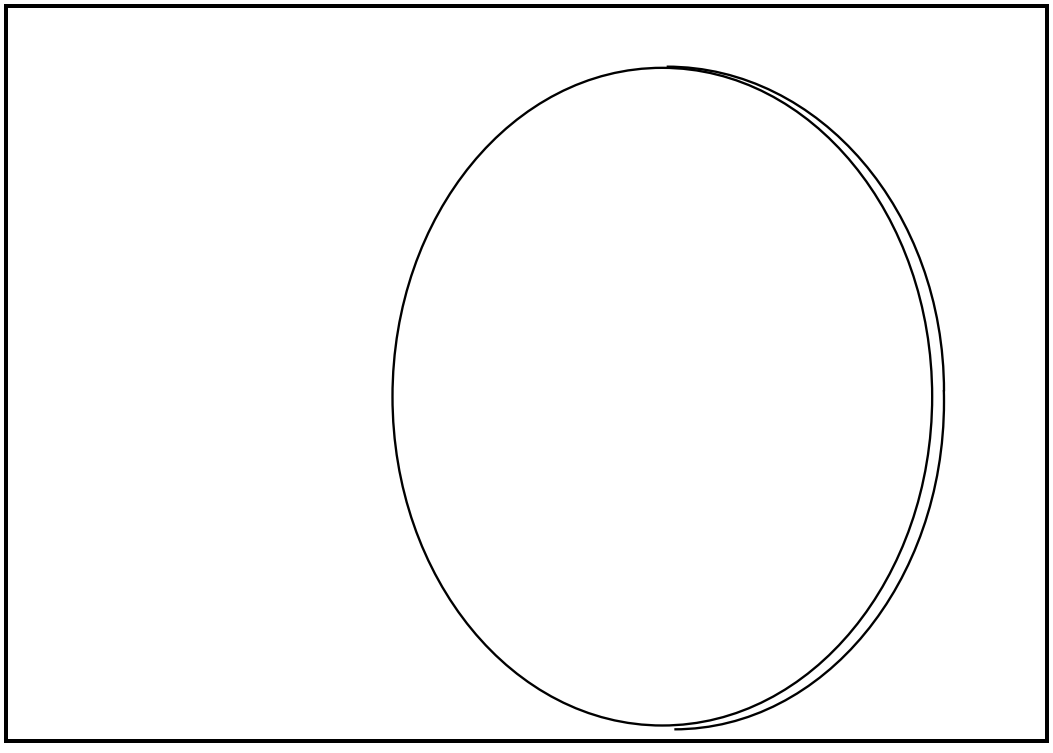

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Count Your Pennies

Lesson plan based on **Alexander Coin**

Analyze and compare imagery and symbolism in ancient Greek and contemporary U.S. coins.

Skills and Focus: Discussion, Cultural Comparisons, Hands-on
Subject Area: English Language Arts
Thematic Connection: Signs and Symbols, Myths and Legends, Connecting Past and Present
Grade Level: Secondary School
Time Needed: 50-90 minutes

Objectives

- Identify the kinds of images that were characteristic of the obverse (front) and reverse (back) sides of ancient Greek coins.
- Interpret, based on the information in and discussion of the story *Coins in the Greek World*, what these images represented in ancient Greek culture.
- Compare these images and what they represented to the images on contemporary U.S. coins.
- Discuss the iconography of both coins and possible reasons for the cross-cultural similarities.
- Research U.S. paper money to discover the meaning behind the symbols on each side of a bill.

Instructional Materials Needed

Story: *Coins in the Greek World*
Chart
Quarters, dimes, nickels, and pennies for students to examine

Activity

Step 1: Watch the story *Coins in the Greek World.* Encourage students to take notes as they watch. Then, distribute the chart.

Step 2: Ask students to refer to their notes as they fill out the ancient Greek portion of the chart.

Step 3: Now ask students to look carefully at contemporary U.S. coins, and then fill out the second portion of the chart.

Step 4: After students have completed their charts, discuss the results.

Critical Thinking Ask students to

- **explain** why ancient Greek and contemporary U.S. coins are so similar in their design.

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• **identify** how U.S. coins symbolize the nation.

Step 5: Have students use print and online resources to research the design of U.S. paper money. Students should research $1, $5, $10, $20, $50, and $100 bills. Discuss their findings.

Critical Thinking Ask students to

• **describe** the similarities between coins and paper money.

• **explain** the meaning behind the various signs and symbols found on the different bills.

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Ancient Greek Coins
Front Image:
Represents:
Back Image:
Represents:
Contemporary U.S. Coins
Front Image:
Represents:
Back Image:
Represents:

Coin Content

Lesson plan based on **Alexander Coin**

Calculate ancient Greek coin values as compared to their weight, equivalence in grain, and determine their worth today.

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Skills and Focus: Calculation
Subject Area: Mathematics
Thematic Connection: Money, Counting and Calculating, Connecting Past and Present
Grade Level: Secondary School
Time Needed: 60 minutes

Objectives

- **Understand how to calculate fractions of a given weight.**
- Use decimal numbers.
- Convert from metric to U.S. customary weight systems.

Instructional Materials Needed

Chart
Online Resources:
• Demosthenes, *Against Phormio* 39:
http://www.perseus.tufts.edu/cgi-bin/text?lookup=dem.+34.39&word=grain
•Aristotle, *Economics* 1352b:
http://www.perseus.tufts.edu/cgi-bin/text?lookup=aristot.+econ.+1352b&vers=english;loeb&browse=1

Activity

Step 1: Distribute the chart and work with students to calculate the missing values. Ask students to suggest the appropriate calculations.

Step 2: After calculating the value of the coins, relate their value to that of a silver dollar (1 oz.). Calculate how much the silver in these ancient Greek coins would be worth today (assuming the value of silver at $7.50/oz.).

Step 3: Look through the following passages together with the class in order to learn the prices in silver of ancient grain. Demosthenes, in *Against Phormio* 39, mentions the price of about 12 gallons of grain in Greece as being 5 drachmae. Aristotle, in *Economics* 1352b, mentions the price for the same amount of grain in Egypt as 10 drachmae. If grain weighs about 5 pounds to the gallon, was silver more or less valuable in ancient Athens then it is today? In ancient Egypt?

Step 4: We know that the rowers in the Athenian fleet of warships earned 2 obols a day. How much grain would that buy? How many obols per day would a rower spend on grain, assuming he ate 500g per day? How much money would be left over?

Goals

This activity meets **Illinois State Goal 6:** Demonstrate and apply a knowledge and sense of numbers, including basic arithmetic operations, number patterns, ratios, and proportions.

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Find the Values of Ancient Greek Coins		
Coin	Value	Weight
obol	1/6 drachma	
diobol	1/3 drachma	
drachma		4.1g
didrachm	2 drachmae	
tetradrachm	4 drachmae	

Ancient Atomic Theories

Lesson plan based on **Alexander Coin**

Research ancient texts and compare ancient Greek atomic theories, as used in the production of silver, to modern theories.

Skills and Focus: Chemistry
Subject Area: Science
Thematic Connection: Literature, Connecting Past and Present
Grade Level: Secondary School
Time Needed: 120 minutes

Objectives

- Understand the smelting technology of ancient Greece.
- Understand the human cost of "low-tech" production in Greece.
- Compare and contrast Greek atomic and molecular theories with modern theories.

Instructional Materials Needed

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Texts

Print Resources:

• Healey, J. F. *Mining and Metallurgy in the Greek and Roman World*. London: Thames and Hudson, 1978.

• Tylecote, R. *A History of Metallurgy*. London: Thames and Hudson, 1976.

• Kirk, G. S., A. Raven and M. Schofield. *The Presocratic Philosophers*, 2nd ed. Cambridge: Cambridge University Press, 1983. pp. 402-33.

Activity

Step 1: Research and discuss in class the production of silver in ancient Greece using either Healey or Tylecote.

Step 2: Distribute the texts from Aristotle, Aetius, and Simplicius. After students have read the texts, discuss the Greek theories of atoms, based on the ideas of Democritus.

Critical Thinking Ask students to

• **compare** the Greek and contemporary theories, explaining how the Greek theory of atoms is similar to the modern theories, especially with regard to the physical form of atoms and their shape. (Explain to students that the notion of shape applies to molecules as well as atoms.)

• **explain** how the atoms combine with each other.

• **explain** how the Greek theory might explain chemical reactions, like those that happen as part of smelting.

Goals

This activity meets **Illinois State Goal 13:** Have a working knowledge of the relationships among science, technology, and society in historical and contemporary contexts.

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Aristotle, *Metaphysics*, A4.985b4 (Kirk et al., p. 414)

Leucippus and his associate Democritus hold that the elements are the full and the void; they call them what is and what is not respectively. What is full is solid, what is not is void and rare. Since the void exists no less than the body, it follows that what is not exists no less than what is. The two together are the material causes of existing things. And just as those who make the underlying substance one generate other things by its modifications, and postulate rarefaction and condensation as the origin of those modifications in the same way that these men too say that the differences [in their elements] are the causes of other things. They hold that these differences are three—shape, arrangement and position; being, they say, differs only in "rhythm, touching and turning" of which *rhythm* is shape, *touching* is arrangement and *turning* is position; for A differs from N in shape, AN from NA in arrangement, and Z from N in position….

Aetius, I, 3, 18 (from Kirk et al., p. 421)

Democritus named two [properties of atoms], size and shape; but Epicurus added a third to these, namely weight…. Democritus says the primary bodies (that is, the solid atoms) do not possess weight but move in the infinite as the result of striking one another….

Simplicius, *de caelo* 242, 21 (Kirk et al., 425)

As they [the atoms] move they collide and become entangled in such a way as to cling in close contact to one another, but not so as to form one substance of them in reality of any kind whatever; for it is very simple minded to suppose that two or more could ever become one. The reason he gives for atoms staying together for a while is the intertwining and mutual hold of the primary bodies; for some of them are angular, some hooked, some concave, some convex, and indeed with countless other differences; so he thinks they cling to each other and stay together until such time as stronger necessity comes from the surrounding and shakes and scatters them apart….

The Odyssey of a Coin

Lesson plan based on **Alexander Coin**

Create a fictitious newspaper article to document the travels of an ancient Greek coin.

Skills and Focus: Writing, Calculation, Analysis, Geography
Subject Area: Social Science
Thematic Connection: Money, Geography

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Grade Level: Secondary School
Time Needed: 40 minutes

Objectives

- Evaluate the economic conditions that existed in ancient Greece.
- Analyze the impact Alexander the Great had on the ancient world.

Instructional Materials Needed

Stories: *Who Was Alexander?* and *Coins in the Greek World*
Alexander Map

Activity

Explain to students that coins enable societies to exchange goods along standard units of value. Coins pass through many hands and over great distances. Therefore, the images on coins can reveal interesting information about the size of a nation's commerce and influence.

Based on what students learn and perceive from both movies, have them write a newspaper article about the spread of Alexander the Great's empire (335-323 BC) as documented through the fictitious travels of the Alexander coin. Articles should include information like the following:

- the standard unit of value in many Greek cities
- items the silver coin might have purchased
- whether the silver coin might have come in contact with smaller units of currency (e.g., obol, a silver coin of ancient Greece equal to one-sixth of a drachma)
- where the silver coin was minted and to what regions it traveled
- which people may have possessed the silver coin

Goals

This activity meets **Illinois State Goal 15**: Understand, analyze, and compare economic systems, with an emphasis on the United States.

This activity meets **Illinois State Goal 18**: Understand, analyze, and compare social systems with an emphasis on the United States.

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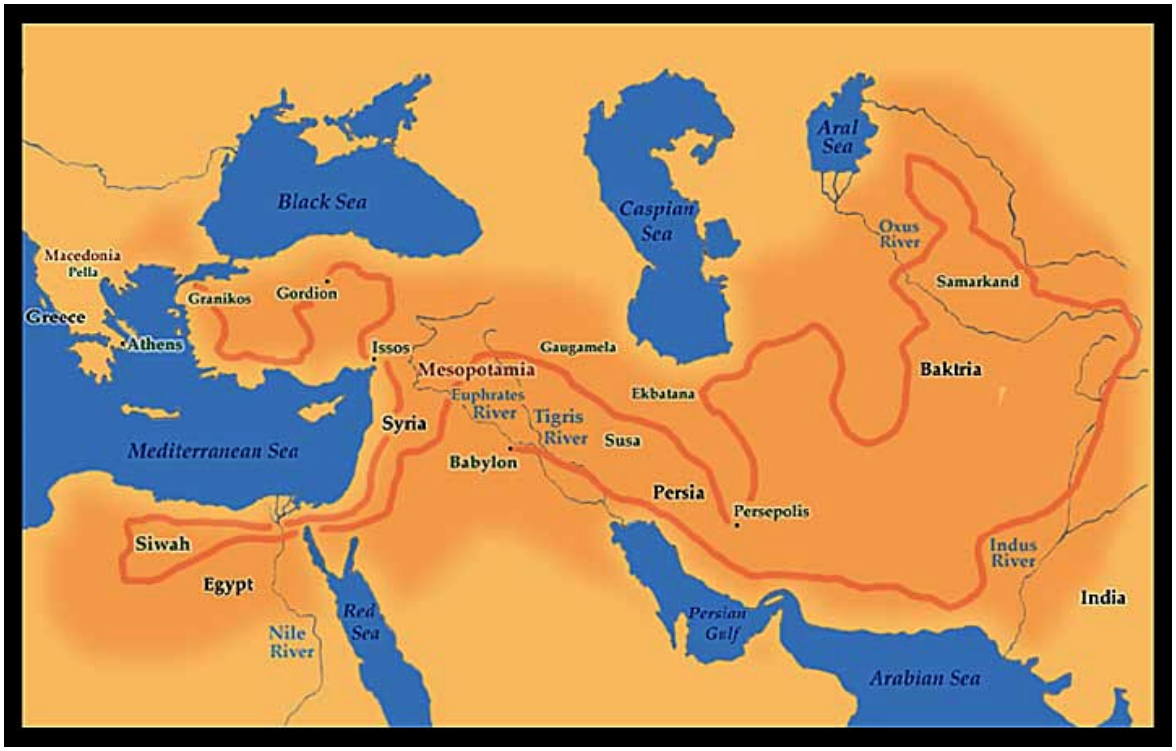

Form and Function

Lesson plan based on **Amphora**

Discover the function of ancient Greek vessels by comparing their characteristics.

Skills and Focus: Art History
Subject Area: Fine Arts
Thematic Connection: Home and School
Grade Level: Secondary School
Time Needed: 50 minutes

Objective

- Compare and contrast two ancient Greek vessels to determine the function of each.

Instructional Materials Needed

Stories: *How Was This Made?* and *The Festivals of Dionysos*
Worksheet 2
Amphora
Stamnos

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Activity

Explain to students that although these two vessels may look similar to modern viewers, their uses within ancient Greek culture were different and can be identified through their individual characteristics. Encourage students to take notes as they watch the two stories. Then, using their notes and pictures of the vessels, have students complete the worksheet to see how the vessels compare.

Goals

This activity meets **Illinois State Goal 25:** Know the language of the arts.

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	AMPHORA	STAMNOS
Type of vessel		
Purpose		
Black or red figure?		
Details added how?		
Story/figures depicted		
Attributes of main figures		
Role of figures in society		
Who used this vessel?		
Where was it used?		
Similar vessel used today?		

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A Legendary Speech

Lesson plan based on **Amphora**

Explore the characteristics of ancient and contemporary legends and compose and deliver a speech about a specific legend**.**

Skills and Focus: **Discussion, Cultural Comparisons, Writing**
Subject Area: **English Language Arts**
Thematic Connection: **Myths and Legends, Connecting Past and Present**
Grade Level: **Secondary School**
Time Needed: **90 minutes**

Objectives

- Define *legendary* as it was used to describe Herakles in ancient Greece and as it is used today.
- Compose and deliver a speech that recalls a legend from the 20th century.

Instructional Materials Needed

Story: *What Story Is Shown?*

Activity

Step 1: Begin by discussing the concept of legends. Be sure students understand that a legend can be either a person who accomplished some remarkable feat or an event of longstanding significance.

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Step 2: After watching *What Story Is Shown?*, discuss what the students already know about the character of Herakles.

Critical Thinking Ask students to

- explain why the ancient Greeks painted an image of him onto an amphora.
- describe Herakles most admirable characteristics.

Step 3: Ask students to think about legendary people and events from the 20th century and to choose either a person or an event to research. Students should look through primary–source documents, as opposed to encyclopedias, to find information about the legend they have chosen.

Step 4: Have each student write a brief speech about his or her legend. The speech should include the following:

- a description of the person or event
- an explanation telling why the person or event is legendary
- a comparison of the person or event to ancient Greek legends

Goals

This activity meets **Illinois State Goal 3:** Write to communicate for a variety of purposes.

This activity meets **Illinois State Goal 4:** Listen and speak effectively in a variety of situations.

Aristophanes's Party

Lesson plan based on **Amphora**

Calculate the length of time it will take for Aristophanes's guests to deplete his supply of wine, and determine how long he can prolong that supply by diluting it.

Skills and Focus: Calculation, Problem Solving
Subject Area: Mathematics
Thematic Connection: Counting and Calculating
Grade Level: Secondary School
Time Needed: 80 minutes

Objectives

- Practice converting from U.S. customary to metric measurements.
- Solve an algebraic problem.

Instructional Materials Needed

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Story: *Symposia: Ancient Greek Drinking Parties*
Math Chart

Activity

Step 1: After watching *Symposia: Ancient Drinking Parties* or introducing the idea of Greek symposia in a discussion, introduce the various drinking vessels and their functions.

Step 2: Distribute the chart. Ask students to determine how long Aristophanes's wine supply will hold out under the following conditions:

- He bought 1 large amphora of wine (26 liters) for the party.
- He mixes the wine with water in a 1:1 ratio.
- His guests consume wine at the rates shown on the chart.

Step 3: If Aristophanes decreases the ratio of wine to water by 10% each time he refills the krater, how much longer will his wine last?

Goals

This assignment meets **Illinois State Goal 6:** Demonstrate and apply a knowledge and sense of numbers, including basic arithmetic operations, number patterns, ratios, and proportions.

This assignment meets **Illinois State Goal 8:** Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

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Guest	Vessel	Vessels per Hour
Socrates	kylix (8 oz.)	3
Alcibiades	rhyton (4 oz.)	5
Perikles	kantharos (8 oz.)	3
Plato	kylix (8 oz.)	3
Cleon	kantharos (6 oz.)	5
Polykrates	kylix (6 oz.)	4
Themistokles	kylix (8 oz.)	3
Aristophanes	rhyton (4 oz.)	6

Pottery Science

Lesson plan based on **Amphora**

Determine the principles of oxidation, reduction, and the color properties of iron–based compounds.

Skills and Focus: Chemistry, Earth Sciences
Subject Area: Science
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 45 minutes

Objectives

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• Understand the principles behind oxidation and reduction.
• Understand the technology used to make ancient Greek slipped pottery as an application of chemistry.

Instructional Materials Needed

Story: *How Was This Made?*
Noble, J. V. *The Technique of Attic Painted Pottery*. London: Thames and Hudson, 1988.

Activity

Step 1: After watching *How Was This Made?*, discuss the principles of oxidation and reduction, and the different compounds that result from exposing ferric oxide in the clay (Fe2O3) to an oxidizing versus a reducing environment.

Equations		
Reducing	$Fe_2O_3 + CO$	$2FeO + CO_2$
Oxidizing	$4\ FeO + O_2$	$2Fe_2O_3$

Step 2: The CO concentration was increased by introducing green wood into the kiln, and shutting off the source of O. Ask students why this would yield a reducing environment. If possible, replicate the above reactions experimentally in the classroom to demonstrate the color change.

Goals

This assignment meets **Illinois State Goal 12:** Have a working knowledge of the fundamental concepts and principles of the life, physical, and earth/space sciences and their connections.

This assignment meets **Illinois State Goal 13:** Have a working knowledge of the relationships among science, technology, and society.

Symposia: Scholarly Parties

Lesson plan based on **Amphora**

Hold a symposium during which students debate the benefits of democracy in ancient Greece and the United States.

Skills and Focus: Discussion, Reading, Hands-on, Cultural Comparisons
Subject Area: Social Science
Thematic Connection: Comparing Cultures
Grade Level: Secondary School

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Time Needed: 60 minutes

Objective

• Understand the role of symposia in ancient Greek culture and politics.

Instructional Materials Needed

Story: *Symposia: Ancient Greek Drinking Parties*
Selections from Plato's essay *The Symposium*.

Activity

Remind students that in ancient Greece, men of culture, philosophers, and scholars held scholarly discussions at drinking parties called symposia. At such gatherings friendships, political alliances, and philosophical ideas were born and nurtured.

Turn your class into an abbreviated, contemporary symposium. Assign students the topic: "The Benefits of Democracy in Ancient Greece and the United States." Have students create a dialogue in which the benefits of democracy in both cultures are outlined, discussed, and compared. Direct the students' discussions by having them consider:

- the role of education
- the freedoms enjoyed
- balance of powers in government
- the role of leaders
- the image of leaders

Goals

This activity meets **Illinois State Goal 16**: Understand and analyze events, trends, individuals, and movements shaping the history of Illinois, the United States, and other nations.

Abstract to Real: The Human Form in Art

Lesson plan based on **Cycladic Figure**

Analyze and evaluate the effects of abstraction and realism on depictions of the human form in ancient and modern–day cultures.

Skills and Focus: Art Appreciation, Studio
Subject Area: Fine Arts
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 20 min. for discussion, time for studio projects

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Objectives

• Recognize and discuss the use of abstraction in the Cycladic figure and realism in the Attic Stele.
• Analyze how the use of abstraction and realism affects the meaning and ideas conveyed in each object.
• Create an abstract self-portrait and a realistic self-portrait using drawing materials.
• Evaluate how the use of abstraction or realism affects the choices and decisions artists make during the creative process.

Instructional Materials Needed

Stories: *Who Is This?, The Human Form in Cycladic Art,* and *What Is Shown Here?,* which discusses the Attic Stele
Drawing or construction paper
Pencils or pastels
Mirrors

Activity

Step 1: While both the Cycladic figure and the Attic Stele depict the human form, one is abstract and one realistic. Discuss the characteristics of each object.

Critical Thinking Ask students to

• **explain** the roles line and shape play in the creation of a form.
• **describe** how artists depict volume.
• **describe** the details that appear in each object.
• **explain** how the details are added.

Step 2: Instruct students to create an abstract self–portrait using pencils or pastels. Students should concentrate on the use of shape and line in the portrait to depict the essence of the human form.

Step 3: Now students should create a realistic self–portrait with the same materials, concentrating on the use of volume and personal details to create a recognizable image.

Critical Thinking Ask students to

• **analyze and explain** how the decisions and processes they use differ as they create each self–portrait.

Goals

This activity meets **Illinois State Goal 25:** Know the language of the arts.

This activity meets **Illinois State Goal 26:** Through creating and performing, understand how works of art are produced.

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Women in Ancient Greece

Lesson plan based on **Cycladic Figure**

Interpret the myth of Arachne and its depiction of women's activities and valued traits.

Skills and Focus: Reading, Discussion, Critical Analysis
Subject Area: English Language Arts
Thematic Connection: Myths and Legends
Grade Level: Secondary School
Time Needed: 50 minutes

Objectives

- Understand the myth of Arachne and the concept of metamorphosis.
- Discuss the activities, concerns, and other aspects of women's lives in ancient Greece.
- Understand ancient myths as explanations for curious natural phenomena.

Instructional Materials Needed

Story: *Who Is This?*
Warner, Rex. "Arachne," in *Adventures for Readers Book One*. Orlando: Harcourt Brace
Jovanovich, 1989.

Activity

Step 1: Watch the story *Who Is This?*, which introduces the myth of Arachne as a story that details events in the lives of Greek women (the subject of the *Cycladic Figurine*) and explains a natural phenomenon. Then have students read the story. Explain that this story presents a myth intended to explain the existence of the spider. When students have finished the story, discuss the place of women in Arachne's society.

Critical Thinking Ask students to

- **identify** which social class these women seem to belong to.
- **assess** their level of education.
- **explain** how Arachne's lifestyle is apparent in her attitude.

Step 2: Discuss the ending of the story.

Critical Thinking Ask students to

- **explain** why Arachne hangs herself.
- **illustrate** what this tells the reader about Arachne.

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• **conclude**, in light of the suicide attempt, whether Minerva's spell is a punishment or a blessing.

Step 3: Ask students to write a sequel to the myth of Arachne, from the perspective of Arachne the spider, who is seeking revenge either on Minerva or on all modern women. Remind students that Arachne the spider's actions and motivation must be consistent with those of Arachne the woman. Encourage students to share their sequels.

Goals

This activity meets **Illinois State Goal 1:** Read with understanding and fluency.

This activity meets **Illinois State Goal 2:** Understand explicit and implicit meaning in literature representing individual, community, national, world, and historical perspectives.

This activity meets **Illinois State Goal 4:** Write to communicate for a variety of reasons.

Sculptural Statistics

Lesson plan based on **Cycladic Figure**

Conduct an experiment to determine the frequency of pulling various parts of an ancient Greek sculpture out of a hat.

Skills and Focus: Geometry, Calculation
Subject Area: Mathematics
Thematic Connection: Counting and Calculating, Identifying Patterns
Grade Level: Secondary School
Time Needed: 90 minutes

Objectives

- Conduct a statistical experiment and evaluate its results.
- Introduce basic statistical methods.

Instructional Materials Needed

Cycladic Figure
Math Chart
Scissors
Paper and pencils
Shennan, S. *Quantifying Archaeology*, 2nd ed. Iowa City: University of Iowa Press, 1997.

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Activity:

Step 1: Have students divide the Cycladic figure into 12 simple geometric forms (rectangles, triangle, ovals). Have each student cut up one figure according to these divisions.

Step 2: Record the number of rectangles, triangles, and ovals that result. Then distribute the chart.

Step 3: Put all the parts into a hat. Discuss the chances of pulling a head or a thigh out randomly (1/12, 1/6 and so on). Ask students to speculate whether the odds would change if you put parts from several figures into the hat.

Step 4: Pull out ten items from the hat, one at a time, and record them. After pulling a piece out, replace it so the odds of pulling it or another type out do not change. Tally the results and compare them to the predictions made before. If the predictions were wrong, why might they be wrong? Try the same experiment again and compare results.

Step 5: Use the c2 test to determine whether or not the results obtained are statistically significant.

$$c2 = \mathbf{S}\frac{(Oi-Ei)^2}{Ei}$$

Determine the c2 values for each type, with Oi = obtained results and Ei = estimated results. Estimated results are indicated on the chart. Thus if two heads were pulled out of the hat in ten tries the value would be (2-.825)2 2 = 0.69. Adding up the values for each category results in a c2 value for the trial. Now students must determine the degrees of freedom (n) in order to establish significance.

$$n = k-1$$

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where k is the number of categories being considered.

Thus n would equal 7 if one were deciding on significance according to body parts, but would equal 2 if one were establishing significance with respect to shape. If a table of c2 values is available, have students compare the results to those on the table. If not, the c2 value (at the 0.05 confidence level) for n = 2 is 5.99 and for n = 7 is 14.06. If the c2 value is higher than this then the null hypothesis (that the distribution of samples removed is proportional to their proportions in the population as a whole) is correct. If not, then the null hypothesis is void, and there is some bias affecting the results.

Step 6: Discuss the results.

Critical Thinking Ask students to

- **explain** what c2 represents.
- **explain** why the c2 value would be different for different degrees of freedom.

Goals

This activity meets **Illinois State Goal 6:** Demonstrate and apply a knowledge and sense of numbers, including basic arithmetic operations, number patterns, ratios, and proportions.

This activity meets **Illinois State Goal 10:** Collect, organize, and analyze data using statistical methods to predict results and interpret uncertainty and change in practical applications.

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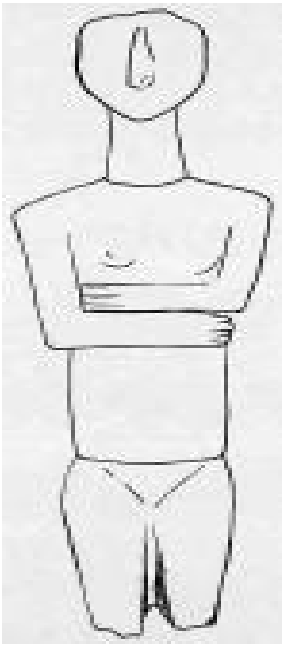
Body Part (shape)	Part Frequency (expected/10)	Shape Frequency (expected/10)
head (oval)	1 (.825)	1 (.825)
upper torso (rectangle)	1 (.825)	10 (8.25)
lower torso (rectangle)	1 (.825)	
upper arm (rectangle)	2 (1.65)	
lower arm (rectangle)	2 (1.65)	
pubic triangle	1 (.825)	1 (.825)
thigh (rectangle)	2 (.825)	
calf (rectangle)	2 (1.65)	
Total	**12**	**12 (9.90)**



Marble: A Carver's Delight

Lesson plan based on **Cycladic Figure**

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Explore the formation and physical properties of marble and why it is a popular stone to carve.

Skills and Focus: Earth Sciences
Subject Area: Science
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 60 minutes

Objectives

- Understand that different kinds of stone have different physical properties.
- Understand the relationship between formation processes and stone properties.
- Learn how different properties can be used and manipulated by artisans.

Instructional Materials Needed

Story: *Cycladic Stone Carving*
Two different types of marble (Check with a funerary monuments dealer for discarded fragments.)
Other sedimentary and metamorphic rocks for contrast (granite, slate)
Low-power optical microscope

Activity

Step 1: After watching *Cycladic Stone Carving*, discuss with students the properties that make marble a good stone for carving: fracturing properties, translucency and color properties, polishing properties.

Step 2: Tell students to investigate the formation of marble with a standard geology textbook. They should read about the properties of sedimentary versus igneous and metamorphic rocks, and look for the answers to these three questions:

- In what ways does marble behave like a sedimentary rock?
- In what ways does it conform to the properties of a metamorphic rock?
- How are these properties important to it as a sculptural material?

Step 3: Have students look at the different rock samples under a microscope at low power (20x) and make observations about the structure of marble in comparison to the other stones. Students should note grain size, crystal formation, and crystal shape.

Goals

This activity meets **Illinois State Goal 12:** Have a working knowledge of the fundamental concepts and principles of the life, physical, and earth/space sciences and their connections.

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Ancient Abstraction

Lesson plan based on **Cycladic Figure**

Compare and debate how an ancient Greek sculpture is similar to modern art.

Skills and Focus: Oral Presentation, Discussion, Cultural Comparisons, Art History
Subject Area: Social Science
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 40-90 minutes

Objectives

• Describe the cultural contributions of early Greek civilization and their relationship to the modern world.

Instructional Materials Needed

Story: *The Human Form in Cycladic Art*
Online Resources:
• http://cpcug.org/user/stefan/brancus.html
• http://www.optonline.com/comptons/ceo/00061_A.html
Print Resources:
• *The Art Institute of Chicago: Twentieth-Century Painting and Sculpture*. The Art Institute of Chicago, 1996. pp.23, 48.

Activity

Even though the Cycladic figure is over 5,000 years old, many think it looks very modern. Divide the class into two groups. Have each group develop a brief presentation in which:

• the Cycladic figure is compared to Constantin Brancusi's 20th century sculpture, *Leda.*
• students consider why Brancusi may have been inspired by 5,000-year old Cycladic sculpture.
• students consider how Brancusi's sculpture comments on his approach to the modern and classical worlds.
• students consider what each sculpture says about each artist's approach to naturalistic subjects.

Goals

This activity meets **Illinois State Goal 16**: Understand and analyze events, trends, individuals and movements shaping the history of Illinois, the United States, and other nations.

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Portrait Propaganda

Lesson plan based on **Hadrian**

Design an installation for a portrait of Hadrian in an ancient Roman town to illustrate and comprehend its propaganda role in daily life.

Skills and Focus: Art History, Studio
Subject Area: Fine Arts
Thematic Connection: Signs and Symbols
Grade Level: Secondary School
Time Needed: 30 minutes, plus time to design, complete, and evaluate projects

Objectives

- Describe how this image of Hadrian and other sculptures of the emperor were used as propaganda in the Roman empire.
- Design an ancient Roman installation for the bust based on analysis of the object.
- Evaluate the effectiveness of these installations through a juried competition.

Instructional Materials Needed

Stories: *Who Was Hadrian?* and *Portraits of Roman Emperors*
Materials as needed to complete installation designs
Bibliography of Roman and Greek portraiture:
http://www.perseus.tufts.edu/~acsmith/Portraiture.html#sources

Activity

Portraits of emperors were powerful propaganda tools in ancient Roman society. Towns throughout the empire erected copies of the official portrait in public places to demonstrate their allegiance to the emperor. Have students imagine they are responsible for designing the installation for this portrait of Hadrian in their ancient Roman town. Students can submit both drawings and three-dimensional models to a student jury which will then pick the winning design.

Goals

This activity meets **Illinois State Goal 26:** Through creating and performing, understand how works of art are produced.

This activity meets **Illinois State Goal 27:** Understand the role of the arts in civilizations, past and present.

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Vocabulary of Ancient Rome

Lesson plan based on **Hadrian**

Define ancient Roman vocabulary using the dictionary writing sentences.

Skills and Focus: Vocabulary, Research
Subject Area: English Language Arts
Thematic Connection Connecting Past and Present
Grade Level: Secondary School
Time Needed: 90 minutes

Objectives

- Define ten new words that relate to ancient Roman and Greek cultural life.
- Use the dictionary to discover the definitions of words and their etymologies.
- Find contemporary usage of these words, in titles, brand or corporate names, or architecture.

Instructional Materials Needed

Stories: *Who Was Hadrian?* and *How Was This Made?*
Dictionaries for each student
Hadrian Transcripts
Internet access to search for contemporary examples of words

Activity

Step 1: Write the following words on the chalkboard, asking students to copy them onto a sheet of paper: caryatid, aqueduct, pantheon, odeon, deify, rasp, emery, abrasives, sophisticated, equestrian. Show the stories *Who Was Hadrian?* and *How Was This Made?* and ask students to listen for these words and look for the images that accompany them.

Step 2: Ask students to discover the definition of each of these words that matches its ancient context. *Rasp*, for example, is used in a very specific way in the story *How Was This Made?* Encourage students to refer to the transcripts of the movies to determine context.

Step 3: As students look up the first word, *caryatid*, instruct them to look at the bracketed portion of the dictionary entry to find the etymology of the word. Introduce them to the abbreviations *L* and *Gk*, which refer to Latin and Greek, respectively, as well as the abbreviation *fr*. (from). Demonstrate how to read the etymology so that the students can write down the Latin and/or Greek form of the word, and how it was derived (including meanings of roots when available).

Step 4: Ask students to find examples of contemporary usage for five of the ten vocabulary words, and to use these words in sentences that demonstrate understanding of their meaning. Ask students to share their sentences.

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Goals
This activity meets **Illinois State Goal 1:** Read with understanding and fluency.

This activity meets **Illinois State Goal 5:** Use the language arts for inquiry and research to acquire, organize, analyze, evaluate, and communicate information.

HADRIAN:Who was Hadrian?

Hadrian was born in A.D. 76 to a Roman family living in southern Spain. He was a cousin of the childless emperor Trajan, who on his deathbed adopted Hadrian as his son and successor.

Hadrian spent most of his early career in the army, serving under Trajan in Germany and Dacia, which is in modern Hungary and Romania. Hadrian's portrait appears on Trajan's column in Rome, which commemorates the conquest of Dacia. As emperor, Hadrian travelled widely in the empire, visiting most of the provinces over the twenty years of his reign.

He paid to have buildings, aqueducts, and roads built in many cities, like the Temple of Olympian Zeus in Athens, the ruins of which are seen here.

Hadrian was also a talented architect. He designed and built magnificent structures in Rome, including the Pantheon, a great domed temple dedicated to the twelve Olympian gods. The vast dome of Hadrian's Pantheon is as impressive today as it was nearly two thousand years ago, soaring 150 feet over visitors' heads.

Citizens from around the empire responded to Hadrian's interest and generosity by erecting statues in Hadrian's honor, like this statue recently excavated in the odeon, a small
theater in the Roman city of Troy in northwestern Turkey. Given the fine quality of the Art Institute's portrait of Hadrian, it probably came from a public dedication or cult statue. After Hadrian's death he was honored as a god by the Roman people.

HADRIAN:How was this made?

The Romans made hundreds of copies of statues of the emperors, spreading them around the whole Empire, from Britain to Jordan. Artists made new portraits of the emperors to celebrate important moments of their careers, like accession to the throne or important military victories.

Copies of the original portrait were sent to major centers around the empire, from which additional copies were produced for distribution to smaller cities and towns. Greek and Roman sculptors carved stone using very simple tools. First, the sculptor used a hammer and pointed punch to shape the marble block, chipping large flakes of stone away. The head of this unfinished Roman copy of a Greek warrior still bears the pockmarks made

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by a point chisel. The sculptor then used a claw chisel to refine the shape. The teeth of the claw chisel have left parallel scars on the torso of the same statue.

To make a copy of an original statue, the artist took very careful measurements of key points on the surface of the original. When transferred to the copy, he marked these points
with raised bosses, not yet removed from this one.

After marking the key points on the copy, the sculptor carved the marble with more delicate tools, like flat chisels, files, and rasps. Fleshy surfaces could be smoothed and polished using abrasives, like powdered emery. Drills were used to cut lines of tiny starter holes where the sculptor wished to carve curves and deep grooves. The bits of marble between the holes could then be chiseled away carefully to create sweeping curves. Using these simple techniques, Roman sculptors were able to produce some of the most sophisticated portraits ever carved.

Measuring Supporting Structures

Lesson plan based on **Hadrian**

Calculate the volume of the Pantheon's columns and estimate changes in weight given different parameters.

Skills and Focus: Geometry, Calculation
Subject Area: Mathematics
Thematic Connection: Counting and Calculating
Grade Level: Secondary School
Time Needed: 80 minutes

Objectives

- Determine the differences in volume of columns of different heights and diameters.

Instructional Materials Needed

Story: *Who Was Hadrian?*
Printouts of various views of the Pantheon (found at http://harpy.uccs.edu/roman/html/pantheonslides.html)

Activity

Step 1: After watching *Who Was Hadrian?*, emphasize that Hadrian was not only the emperor of Rome, but also the designer of the Pantheon and other important buildings.

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Step 2: Look at images and plans of the Pantheon with the class. Discuss with the students the basic two–dimensional and three–dimensional shapes used in designing the Pantheon.

Step 3: Have students calculate the volume of the columns as they now exist. Measure their sizes on an elevation plan. The formula for the volume of a column is v = r2h.

Step 4: Have students calculate what the volume of the column would be if it were 10 meters higher yet maintained the same ratio of thickness to height (**Hint:** Calculate the ratio of height to thickness and use it to calculate the thickness at a different height).

Problem: How much larger a piece of granite (what percentage of the original) would be needed to make these columns 10 meters higher than they are? If the granite weighed approximately 3,000 kg/m3, how much would the columns of each size weigh?

Goals

This activity meets **Illinois State Goal 8:** Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

This activity meets **Illinois State Goal 9:** Use geometric methods to analyze, categorize, and draw conclusions about points, lines, planes, and space.

Testing Carving Tools

Lesson plan based on **Hadrian**

Construct an ancient bow drill and compare its effectiveness at carving stone to marks made by other tools.

Skills and Focus: Scientific Inquiry
Subject Area: Science
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 100 minutes

Objectives

- Replicate an ancient bow drill.

Instructional Materials Needed

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Story: *How Was This Made?*
Bow and Drill Diagram
Dowels, 8” in length
Handles (a wooden doorknob-like handle will suffice)
Wood files
String
Bow-like curved piece of wood
Emery powder or other abrasive (e.g., fine sand)
Bow drills, sculpting chisels and rasps of different types
Marble slab
Slate slab
Scale to weigh debris
Notebooks and pens

Activity

Step 1: Lead the class in making a bow drill according to the diagram. The drill consists of a slender dowel that is smoothed at one end to fit into a socket–like handle. The handle can be fashioned from the wooden doorknob handles by hollowing out a smooth socket in the center of the underside bottom of the handle. The socket needs to be loose and its interior smooth to allow the drill to rotate.

Step 2: The bow can be made from a curved piece of wood with a slightly loose string which can be wound around the drill shaft to make it rotate. Powdered emery or fine sand provides an abrasive.

Step 3: Have students use the drill to cut into stones of varying hardness (e.g., slate, marble). Tell students to record in their notebooks about how many strokes it takes to drill standard depths (1/2 cm).

Step 4: Compare the marks made by the drill to marks made by other tools (e.g., rasp, flat chisel, claw chisel, punch). Ask students to answer the following questions:

- How much material does each of these tools remove at a time? (Weigh the flakes chipped away by each stroke).
- Assuming that an artisan would prefer to proceed from larger–to finer–scale cutting, what would be a likely sequence of working with these tools?
- How would it be possible to distinguish these different marks in order to reconstruct the carving process?

Goals

This activity meets **Illinois State Goal 11:** Have a working knowledge of the processes of scientific inquiry and technological design to investigate questions, conduct experiments, and solve problems.

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dowel

doorknob
(with hollowed-out
section on bottom)

bow-like curved wood with string attached to one end

drill with string wrapped around handle and attached to other end of bow

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Honoring An Imperial Legacy

Lesson plan based on **Hadrian**

Research, compare, and identify imperial Rome's impact on modern governments.

Skills and Focus: Cultural Comparisons, Writing

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Subject Area: Social Science
Thematic Connection: Comparing Cultures
Grade Level: Secondary School
Time Needed: 60-90 minutes

Objectives

• Compare the political system of ancient Rome to modern political systems throughout the world.

Instructional Materials Needed

Stories: *Who Was Hadrian?* and *Portraits of Roman Emperors*

Activity

Have students research imperial Rome and write an essay that identifies its impact on modern governments (e.g., 18th-century absolutism, 20th-century totalitarianism, and so on). Have students compare modern leaders to Hadrian, identifying those leadership traits and accomplishments they have in common. After students have written their essays, have them debate which aspects of ancient and modern leadership worked most effectively and why.

Goals

This activity meets **Illinois State Goal 14**: Understand, analyze, and compare political systems with an emphasis on the United States.

Modern Mosaics

Lesson plan based on **Mosaic Floor**

Construct individual mosaics that simulate ancient Roman techniques of manipulating tesserae to create three–dimensional illusions.

Skills and Focus: Studio, Art Appreciation
Subject Area: Fine Arts
Thematic Connection: Identifying Patterns
Grade Level: Secondary School
Time Needed: 80 minutes

Objectives

• Explore the elements of contrast, emphasis, pattern, and color schemes by identifying how the artist manipulated tesserae in the mosaic.
• Explain how the use of tesserae creates specific effects, such as a sense of volume or shadowing.

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• Create original mosaics by manipulating torn paper to depict different textures and details.

Instructional Materials Needed

Stories: *What Animal Is This?* and *How Were Mosaics Made?*
Pencils
11 x 17” construction paper or cardstock
Construction paper in a variety of colors, torn into small pieces of uniform size (approximately 1/2" square)
Glue sticks
Foil, ribbon, fabric remnants, or other materials as desired

Activity

Step 1: Explain to students that mosaics like this one were used to decorate private homes in ancient Rome. Discuss how mosaic artists created decorative patterns by making different shapes or lines with tesserae. Have students produce line drawings and experiment with patterns by manipulating paper tesserae on the drawings to create textures and details.

Step 2: Next have students produce a line drawing for an original mosaic design on 11 x 17" construction paper or cardstock, making notations for patterns and textures.

Step 3: Instruct students to fill in the drawings with tiny pieces of colored paper, foil, ribbon, or other materials. Discuss the process with students.

Critical Thinking Ask students to

• **describe** the techniques they use to produce the desired effects.
• **explain** how they manipulate the materials.

Goals

This activity meets **Illinois State Goal 25:** Know the language of the arts.

This activity meets **Illinois State Goal 26:** Through creating and performing, understand how works of art are produced.

Animals in Ancient Rome

Lesson plan based on **Mosaic Floor**

Discuss a fictional account of a gladiatorial combat and write an editorial that defends or criticizes the type of justice presented in the story.

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Skills and Focus: Reading, Discussion, Critical Analysis, Writing
Subject Area: English Language Arts
Thematic Connection: Animals
Grade Level: Secondary School
Time Needed: Two 90-minute class periods

Objectives

- Understand the various purposes of animals in ancient Rome.
- Comprehend a fictional account of a criminal pitted against an animal in a public display similar to the ancient Roman amphitheater.
- Discuss this account, student reactions to its inconclusive ending, and its cultural and moral implications.
- Write a defense of or a criticism of the king's type of justice.

Instructional Materials Needed

Story: *What Animal Is This?*
Chart
Print Resources:
- Stockton, Frank R. "The Lady or the Tiger?" in *Prentice Hall Literature: Gold.* New York: Prentice Hall Books. pp. 49–53.
- Corbishley, Mike. *The Roman World*. New York: Warwick Press, 1986.
- James, Simon. *Eyewitness Books: Ancient Rome.* New York: Alfred A. Knopf, 1979. Pp. 24–25, 28–35.

Online Resources:
- Images of the colosseum: Encyclopaedia Britannica Online: http://www.eb.com (search for colosseum)

Activity

Step 1: After showing the story *What Animal Is This?*, introduce students to the role of animals in ancient Rome. Animals served many purposes. Some were used in sporting events, others were sacrificed to the gods in religious ceremonies, and many served as symbols for gods or geographic areas. If possible, show some of the images in the James book. Also, distribute the chart.

Step 2: Have students read Stockton's short story, "The Lady or the Tiger?". Explain to students that the story demonstrates the popularity of public games and combat involving animals among ancient Roman people.

Step 3: After students have read the story, encourage them to discuss the conclusion. The inconclusive ending is certain to inspire some discussion about whether the lady or the tiger came out of the chosen door, as well as some criticism of the story and perhaps of the author, who left his work open to interpretation. Encourage the students to support their arguments with evidence from the text.

Step 4: Guide the class in a critical discussion of the punishment.

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Critical Thinking Ask students to

- **explain** why the king found this to be a good punishment.
- **describe** the kind of culture that would support and enjoy such justice.

Step 5: Assign students to write a short editorial in a fictional newspaper of the "semi–barbaric land" that either defends or criticizes the king's method of punishing or rewarding criminals. Tell students that supporting evidence from the story will strengthen their arguments.

Goals

This activity meets **Illinois State Goal 1**: Read for understanding and fluency.

This activity meets **Illinois State Goal 3**: Write to communicate for a variety of purposes.

This activity meets **Illinois State Goal 5**: Use the language arts for inquiry and research to acquire, organize, analyze, evaluate, and communicate information.

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The Place of Animals in Ancient Rome	
Sports and Personal Use	**Religious or Symbolic Use**
lions, tigers • gladiatorial combat • capital punishment **horses** • contests • races **bears, giraffes, elephants** • parades • park displays **wild boars, fish, fowl** • hunting **cats, dogs, insects** • personal pets	**Venus and dove, Jupiter and eagle** • association with gods **she-wolf** • founding of Rome **goats, boars, small birds** • sacrificial offerings to gods

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A Matter of Proportion

Lesson plan based on **Mosaic Floor**

Measure the relative heights of the mosaic giraffe and its trainer and compare their proportions to an actual giraffe and zoo trainer.

Skills and Focus: Measuring, Calculation
Subject Area: Mathematics
Thematic Connection: Counting and Calculating
Grade Level: Secondary School
Time Needed: 90 minutes

Objectives

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• Measure the relative heights of the mosaic giraffe and its trainer and compare their proportions to an actual giraffe and zoo trainer.

Instructional Materials Needed

http://www.lpzoo.com/animals/mammals/facts/b_giraffe.html
Mosaic
Rulers

Activity

Step 1: Distribute copies of the mosaic floor. Ask students to measure its height and width along with the height of the trainer and giraffe. Have students calculate the ration of the trainer's height to that of the giraffe.

Step 2: Distribute the Lincoln Park Zoo Giraffe Fact Sheet. Ask students the following questions:

- According to the fact sheet, how tall is an average giraffe?
- How tall is an average person?
- What is the ratio of a person's height to that of a giraffe?
- Are the mosaic giraffe and trainer represented in their proper proportions? How should the mosaic figures be changed?

Step 3: Tell students that each stone chip in the mosaic is approximately 0.4 cm on each side. Given this measurement, how much stone was needed (in kg) to make the mosaic? Assume that the stone weighs 2700kg/m3.

Goals

This activity meets **Illinois State Goal 6:** Demonstrate and apply a knowledge and sense of numbers, including basic arithmetic operations, number patterns, ratios, and proportions.

This activity meets **Illinois State Goal 7:** Estimate, make, and use measurements of objects, quantities, and relationships and determine acceptable levels of accuracy.

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Wild Kingdom

Lesson plan based on **Mosaic Floor**

Research and discuss the natural habitats and various evolutionary theories of giraffes and other animals imported into ancient Rome.

Skills and Focus: Earth Sciences, Biology
Subject Area: Science
Thematic Connection: Animals, Geography
Grade Level: Secondary School
Time Needed: 90 minutes

Objectives

- Understand the natural habitat of giraffes and the relationship of habitat to evolution.
- Discuss the merits and flaws of Roman, Lemarckian, and Darwinian models of giraffe development.

Instructional Materials Needed

Story: *What Animal Is This?*

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Pliny text

Online Resources:
Lincoln Park Zoo Animal Species Data Sheet: Giraffe:
http://www.lpzoo.com/animals/mammals/facts/b_giraffe.html

Activity

Step 1: Lead students in conducting research on the natural habitats for each of the animals depicted in the story.

Step 2: Have class read Pliny, *Natural History* VIII.69 on giraffes. Several Roman authors thought that giraffes were a hybrid of leopards and camels. Ask students the following questions:

- What features of the animal does this theory help to explain?
- What is wrong with this theory?

Step 3: Discuss with students Darwin's explanations for the unusual form of the giraffe, using a standard biology textbook. Pose the following questions:

- Are Darwin's theories compatible with the Roman theory?
- What does Darwin's theory explain that the Roman theory cannot?
- Which theory accounts best for factors such as habitat?

Goals

This activity meets **Illinois State Goal 12:** Have a working knowledge of the fundamental concepts and principles of the life, physical, and earth/space sciences and their connections.

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From: Pliny the Elder, *Natural History* VIII.69

The Ethiopians give the name of **nabun** to one (animal) that has a neck like a horse, feet and legs like an ox, and a head like a camel, and is of a ruddy color picked out with white spots, owing to which it is called a **camelopardalis**; it was first seen at Rome at the games in the circus given by Caesar when dictator. From this it has subsequently been recognized to be more remarkable for appearance than for ferocity, and consequently it has received the name of **ovis ferae** (wild sheep).

Animals in Myths and Real Life

Lesson plan based on **Mosaic Floor**

Research the role of lions, elephants, and bears in ancient Roman life and mythology.

Skills and Focus: Geography, Research, Writing
Subject Area: Social Science
Thematic Connection: Animals, Myths and Legends
Grade Level: Secondary School
Time Needed: 90 minutes

Objectives

• Develop a strong understanding of the role animals played in important ancient Roman historical events and myths.

Instructional Materials Needed

Story: *What Animal is This?*
Print Resources:
• Material about Hannibal crossing the Alps:
Prevas, John. *Hannibal Crosses the Alps : The Enigma Re-Examined*. Sarpedon, 1998.
•Ovid's Metamorphoses:
Cuyler, Susanna, Ovid. *Ovid's Metamorphoses: An Illustrated Distillation*. Complier, 1996.
Ovid, William S. Anderson. *Ovid's Metamorphoses*. University of Oklahoma, 1998.
• Material about animals in ancient Rome:
Toynbee, J. M. C. *Animals in Roman Life and Art*. London Thames and Hudson: 1973
Online Resources:
• Myths that deal with animals:
http://www.mythology.com

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Activity

Step 1: Explain to students that many Roman mosaics show images of animals that were imported from the far reaches of the empire for parades, private parks, and public games. Animals also were crucial to the daring invasion of Rome by Hannibal, who came from Carthage, on the north coast of Africa. In addition, many real and composite creatures had prominent associations with religious and legendary figures (e.g., lion is one of Hercules' attributes).

Step 2: Have students consider the following animals that were frequently included in Roman mosaics: lions, elephants, bears, eagles.

Ask students to:

- Select one animal from this list.
- Research and write about its function in ancient Roman parades, private parks, or public games.
- Research and write about its association with certain religious and/or legendary figures.
- Compare the perceptions of the animal in ancient Roman historical, mythological, and religious contexts to its perception in contemporary times.

Goals

This activity meets **Illinois State Goal 16**: Understand and analyze events, trends, individuals, and movements shaping the history of Illinois, the United States, and other nations.

Ancient Roman Residential Décor

Lesson plan based on **Fallen Warrior**

Determine how works of art decorated Roman homes and design other artworks to accompany them.

Skills and Focus: Studio, Art History
Subject Area: Fine Arts
Thematic Connection: Connecting Past and Present
Grade Level: Secondary School
Time Needed: 30 minutes, plus time to complete studio projects

Objectives

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• Compare and contrast the Fallen Warrior fragment and the Mosaic Floor to determine how each functioned in a private Roman residence.
• Design and create an object that complements the form, function, and setting of the Fallen Warrior Fragment or the Mosaic Floor.

Instructional Materials Needed

Stories: *Why Was This Sculpture Made?*, *What Animal Is This?*, and *How Were Mosaics Made?* (Instructor may want to view the story *How Were Roman Houses Decorated?* for background information)

Activity

Step 1: Both the Fallen Warrior fragment and the Mosaic Floor were probably commissioned to decorate private Roman residences. As a class, compare these two objects by discussing the following:

- What medium is used in each?
- What techniques are used in each?
- What is the subject of each?
- What are some qualities unique to each?
- What can each subject tell us about its artist and owners?
- In which room do you think each object was placed? Why?

Critical Thinking Ask students to

- **predict** what other objects might be in a Roman house.
- **describe** the ideas or stories such objects might communicate.

Step 2: Have each student create another object to place in the same ancient Roman room that complements either the Fallen Warrior or Mosaic floor.

Goals

This activity meets **Illinois State Goal 26:** Through creating and performing, understand how works of art are produced.

This activity meets **Illinois State Goal 27:** Understand the role of the arts in civilizations, past and present.

The Iliad

Lesson plan based on **Fallen Warrior**

Explore ancient warfare and compare the quarrels of the gods to those of the Trojans and Greeks through a dramatic reading of portions of *The Iliad.*

Skills and Focus: Reading, Discussion, Oral Presentation

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Subject Area: English Language Arts
Thematic Connection: Myths and Legends, Literature
Grade Level: Secondary School
Time Needed: Two to four 50-minute class periods

Objectives

- Identify the major characters in Homer's epic *The Iliad.*
- Understand some of the strategies, external forces, and alliances of the Trojan War.
- Compare the quarrels of the gods with those of the Trojans and Greeks.
- Comprehend the kind of warfare celebrated in the Fallen Warrior relief.

Instructional Materials Needed

Stories: *The Shield of Athena* and *Why Was This Sculpture Made?*
Homer. *The Iliad*. Translated by New York: W. H. D. Rouse Penguin Books, 1964. pp. 1-22, 79-83, 245-265.
Props for dramatic reading

Activity

Before completing the following activity, you may want to ask the students to read books I, VI, XXI, and XXII of the Iliad (corresponding to the page numbers given above). You may also want to assign students to a specific book for the dramatic reading. (See below.)

Step 1: After students watch the stories *The Shield of Athena* and *Why Was This Sculpture Made?*, introduce the students to *The Iliad* and the factors that contributed to the Trojan War. Although the warrior on the shield of Athena is known to be fighting in the Greek war against the Amazons, the principles of valor, loyalty to one's country, and heroism are also applicable to the war against Troy.

Step 2: The excerpts of text shown above correspond to four books of *The Iliad* that trace one battle of the Trojan War, from its origin in a quarrel to the final outcome. If there is enough class time, the entire text should be read so that students will understand the scope of the battle and the characters in it. However, book I and/or book XXI may be eliminated to shorten this activity.

Step 3: Assign students to each of the parts (listed below by section). The classroom can be arranged to provide a set for a dramatic reading of the text incorporating limited movement. In this way, students (those who read and those who participate as non–speaking Greeks or Trojans) can physically get an idea of the words and movements of battle.

Book I**:**
Speaking: Narrator, Achilles, Calchas, Agamemnon, Athena, Nestor, Talthybios and Eurybates, Thetis, Odysseus, Chryses, Zeus, Hera

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Non–speaking: Patroclus, Apollo, members of the assembly

Book VI:
Speaking: Narrator, Hector, Paris, Helen, housekeeper, Andromache
Non–speaking: nurse, maids

Book XXI:
Speaking: Narrator, Achilles (also called Peledies); son of Priam, Asteropaios, Scamandros; Trojan enemies of Achilles, Poseidon, and Athena in the shape of two men; River; Hera; Hephaestus; Ares; Athena; Aphrodite; Apollo; Hermes; Artemis; Priam; Agenor

Book XXII:
Speaking: Hector, Apollo, Achilles (also called Peledies), Priam, Athena, Zeus, Hecuba, Andromache
Non–speaking: Achaeans

Step 4: As students dramatically read each section, allow them to change roles so that all of them are able to read and act out at least one speaking role during the class period. For difficult names, use the pronunciation guide at the back of the text. Discuss the ways in which each section reveals events and situations that served to further the continuation of the war and discuss how the actions and quarrels of the gods mirrored the war itself.

Goals
This activity meets **Illinois State Goal 1**: Read for understanding and fluency.

This activity meets **Illinois State Goal 2**: Understand explicit and implicit meaning in literature representing individual, community, national, world, and historical perspectives.

This activity meets **Illinois State Goal 4**: Listen and speak in a variety of situations.

Underwater Excavation

Lesson plan based on **Fallen Warrior**

Calculate artifact size and ship capacity based on the excavation of an ancient Roman shipwreck.

Skills and Focus: Measuring, Calculation
Subject Area: Mathematics
Thematic Connection: Counting and Calculating

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Grade Level: Secondary School
Time Needed: 60 minutes

Objectives

- Measure distances between objects on an excavation plan.
- Convert measurements from a plan to actual sizes.
- Calculate the average height of ceramic vessels in a shipwreck.
- Calculate the capacity of the ship.

Instructional Materials Needed

Shipwreck Plan
(found at http://nautarch.tamu.edu/ina/siteplan3.htm)
Excavation photos
(found at http://nautarch.tamu.edu/ina/YA4-artifact.htm)
Section Drawing
(found at http://nautarch.tamu.edu/ina/images/Yassiada4/ya4-650.JPG)
Reconstruction
(found at http://nautarch.tamu.edu/ina/images/Yassiada4/ya4-662.JPG)

Activity

Step 1: Discuss the origin of the Fallen Warrior in a shipwreck. Tell students that the Yassiada shipwreck dates to the fourth century AD. Have them estimate the size of the ship and of the artifacts inside based on the scale on the plan.

Step 2: Have students measure and record the sizes of the ceramic vessels from the shipwreck. Help students calculate the average height based on these measurements.

Step 3: Students should estimate the capacity of the ship using the section drawing and reconstruction.

Goals

This activity meets **Illinois State Goal 7:** Estimate, make, and use measurements of objects, quantities, and relationships and determine acceptable levels of accuracy.

This activity meets **Illinois State Goal 10:** Collect, organize, and analyze data using statistical methods to predict results and interpret uncertainty and change in practical applications.

Medicine: Then and Now

Lesson plan based on **Fallen Warrior**

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Read ancient Greek texts to explore ancient healing practices and compare them to modern–day medicine.

Skills and Focus: Biology
Subject Area: Science
Thematic Connection: Comparing Cultures
Grade Level: Secondary School
Time Needed: 100 minutes

Objectives

- Understand Greek healing practices for wounds.
- Compare ancient healing practices to those of modern times.

Instructional Materials Needed

Story: *Who Is the Fallen Warrior?*
Warrior Text
Patroclus bandage
(found at http://www.perseus.tufts.edu/cgi-bin/image?lookup=1992.07.0327&type=vase)

Activity

Step 1: Have the class read the passages provided. Then ask the following questions:

- What are the main techniques of healing wounds?
- How did the Greeks treat problems like infection, wounds, and bleeding?
- Was a special doctor needed to perform medical procedures in ancient Greece?

Step 2: Direct the class to study the image of Achilles binding the wound of Patroclus. Ask the following questions:

- How different do ancient Greek medical practices seem to be from today's?
- Is this a surprising scene for a 2,500 year–old vase? Why?

Step 3: Have students conduct research into modern first-aid practices, using a standard medical reference. Ask students to compare and contrast today's approach to emergency medicine with the techniques used in the ancient world.

Goals

This activity meets **Illinois State Goal 12:** Have a working knowledge of the fundamental concepts and principles of the life, physical, and earth/space sciences and their connections.

This activity meets **Illinois State Goal 13:** Have a working knowledge of the relationships among science, technology, and society in historical and contemporary contexts.

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Pseudo-Apollodorus *Library* e.3.20 (Loeb)

[E.3.20] But Telephus, because his wound was unhealed, and Apollo had told him that he could be cured when the one who wounded him should turn physician, came from Mysia to Argos, clad in rags, and begged the help of Achilles, promising to show the course to steer for Troy. So Achilles healed him by scraping off the rust of his Pelian spear.

Aristotle *Posterior Analytics* 1.13 (Loeb)

To know the fact of the rainbow's existence is for the natural scientist; to know the reason is for the optician, either simply as such or as a mathematical optician. Many of the sciences which are not strictly subordinate stand in this relation; e.g., medicine to geometry. It is for the doctor to know the fact that circular wounds heal more slowly, but it is for the geometrician to know the reason for the fact.*

* Philoponus offers two explanations: (1) because such wounds have the greatest area in relation to their perimeter, (2) because the healing surfaces are farther apart and nature has difficulty in joining them.

Homer, *Iliad*, XI.963 ff. (Fagles 1990 trans.)

“Sprinting close to king Odysseus’ fleet
where the Argives (Greeks) met and handed down their laws,
the grounds where they built their altars to the gods,
there he met Eurypylus, Euaemon’s gallant son,
wounded, the arrow planted deep in his thigh,
and limping out of battle…
“Save me at least. Take me back to my black ship.
Cut this shaft from my thigh. And the dark blood—
wash it out of the wound with clean warm water.
And spread the soothing, healing salves across it,
the powerful drugs that they say you learned from Achilles
and Chiron, most humane of Centaurs taught your friend…
“… Patroclus stretched him out,
knelt with a knife and cut the sharp, stabbing arrow
out of Eurypylus’ thigh and washed the wound clean
of the dark running blood with clear warm water.
Pounding it in his palms, he crushed a bitter root
and covered over the gash to kill his comrade’s pain,
a cure that fought off every kind of pain…
and the wound dried and the flowing blood stopped.

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Homer, *Iliad* XVI.26 ff. (Fagles 1990 trans.)
"Our former champions, all laid up in the ships,
are all hit by arrows or run through with spears.
There's powerful Diomedes, brought down by an archer,
Odysseus wounded, and Agamemnon too, the famous spearman,
and Eurypylus took an arrow-shot in the thigh…
Healers are working over them, using all their drugs,
trying to bind the wounds…"

Euripides *Trojan Women* 1232

Hecuba: Your wounds in part I will bind up with bandages, a wretched healer in name alone, without reality; but for the rest your father must look to that among the dead.

Military Memorials

Lesson plan based on **Fallen Warrior**

Analyze ancient and modern military memorials and determine their success in conveying aspects of war and military sacrifice.

Skills and Focus: Discussion, Art Appreciation, Cultural Comparisons, Analysis, Writing
Subject Area: Social Science
Thematic Connection: Comparing Cultures
Grade Level: Secondary School
Time Needed: 90-120 minutes

Objectives

- Evaluate the roles of social institutions like the military.

Instructional Materials Needed

Story: *The Shield of Athena*
Vietnam Memorial
IwoJima Memorial
Online Resources: American battles
- http://home.earthlink.net/~gfeldmeth/lectures.html

Activity

Step 1: Remind students that Athena's shield reveals a soldier wounded in battle. Even though the battle resulted in a victory, this warrior collapsed from a wound

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to his back. Ask students what the fallen warrior's expression and pose convey about warfare and the military in ancient Greece?

Step 2: Have students research battles in which Americans have been involved (e.g., Gettysburg or Iwo Jima). Discuss their findings, and ask whether they think the Fallen Warrior sculpture realistically conveys the reality of battle and why.

Step 3: Have students research monuments to fallen American soldiers (e.g., the Vietnam Memorial in Washington, D.C.). Ask students to think about how monuments like these evoke the tragedy of warfare and the honor of giving one's life for one's country and inspire others to serve their country. Have students write an essay in which they compare American monuments like the Vietnam Memorial to the Fallen Warrior. Essays should include the similarities and differences students perceive in each country's response to warfare. Students should also explain how each memorial is inspirational. Students should support their opinions with specific visual evidence and documented information.

Goals

This activity meets **Illinois State Goal 18**: Understand, analyze, and compare social systems with an emphasis on the United States.

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