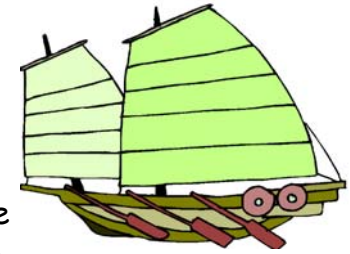# Shipping Across the Centuries

Background: Ships have played a major part in history. You have studied how they were used in the ancient cultures of Greece and Rome. You will now use your knowledge of the ancient cultures of Greece and Rome to complete this challenge. Follow your teacher's directions for researching more information about the ships and boats used by the people living in ancient Greece and ancient Rome.

Design Challenge: Design and build a model of a ship from either ancient Greece or ancient Rome. The design of your ship should include the details that made it unique to its own culture and have at least one simple machine. Your ship should be no smaller than 6 inches long and no larger than 14 inches from bow to stern. It should be able to float in water for at least 5 minutes.

Criteria:

Your ship should
- have a hull longer than 6 inches but shorter than 14 inches
- be designed and decorated with details from the culture it represents
- include at least one simple machine
- float for a period of 5 minutes or longer.

Materials: You may select from the items below.
- card stock/poster board
- construction paper
- tissue paper
- cardboard milk cartons
- brads
- paper clips
- styrofoam trays
- pipe cleaners
- spools
- markers/crayons/colored pencils
- scissors
- string
- paste/glue
- fabric scraps
- craft sticks
- plastic bottles
- straws
- aluminum foil

Targeted Standard of Learning: History and Social Science 3.1, 3.8
Supporting Standards of Learning: History and Social Science 3.4
Science 3.1, 3.2
English 3.1, 3.2, 3.4, 3.6, 3.7

Targeted Standard for Technological Literacy: 9
Supporting Standards for Technological Literacy: 1, 6, 7, 8, 10, 11, 18

Shipping Across the Centuries

Targeted Standard of Learning: History and Social Science 3.1 and 3.8

- The student will explain how the contributions of ancient Greece and Rome have influenced the present world in terms of architecture, government (direct and representative democracy), and sports.
- The student will recognize the concepts of specialization (being an expert in one job, product, or service) and interdependence (depending on others) in the production of goods and services (in ancient Greece, Rome, the West African empire of Mali, and in the present).

Targeted Standard for Technological Literacy: Standard 9

- Students will develop an understanding of engineering design.

| Prior Knowledge & Skill	Materials & Preparation	Safety Issues	Class Management	Materials Provided	Time Management
- Exposure to targeted Standard of Learning 3.8 and supporting History Standard of Learning 3.1 - Research information and pictures of ancient ships - Exposure to supporting Science Standard of Learning 3.2 - Discussion of properties of materials - Some understanding of the design process	- Check Design Brief for recommended materials. Teacher may substitute materials. - Provide a plastic or metal tub for testing the completed ships. - For Web searches, use key words "Ancient Roman Technology," "Ancient Ship Building," "Ancient Greek Technology," and "Ancient Ships." - Oral communication skills are essential for this project. The assignment should be completed in class to emphasize the supporting Standards of Learning objectives.	Supervise cutting of milk cartons, plastic bottles, and styrofoam.	- Small groups of no more than four students - Each child keeps own Guided Portfolio. - Teacher should approve plans before students begin building.	- Design Brief - Guided Portfolio - Rubric Assessments	- Session 1: Introducing Design Brief and Portfolio. (60 min.) - Session 2: Building (60 min.) - Session 3: Sharing and evaluating (45 min.)

Name _____

Shipping Across the Centuries

Group Members: _____

_____   _____   _____

1. What is the problem? State the problem in *your own words*.

_____

_____

_____

_____

Targeted Standard of Learning: History and Social Science 3.1, 3.8

Supporting Standards of Learning: History and Social Science 3.4
Science 3.1, 3.2
English 3.1, 3.2, 3.4, 3.6, 3.7

Targeted Standard for Technological Literacy: 9
Supporting Standards for Technological Literacy: 1, 6, 7, 8, 10, 11, 18
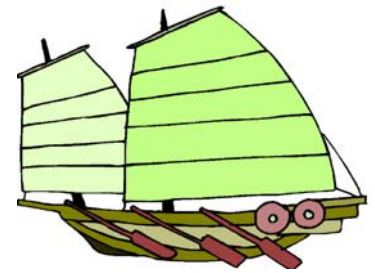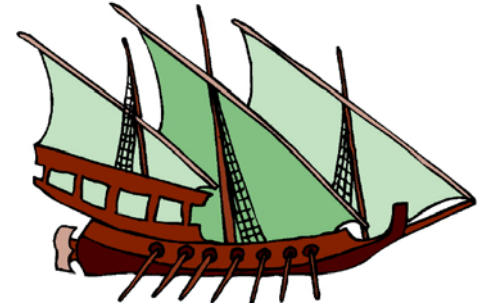
2. Brainstorm solutions.

Draw or describe some possible solutions.

Name _____

3. Create the solution you think is best.

Keep notes below about the problems you have and how you solve them.

_____

_____

_____

_____

_____

_____

_____

_____

Name _____

4. Test your solution.

- Is the hull of your ship longer than 6 inches but shorter than 14 inches?   YES   NO

- Is your ship designed with details from the culture it represents?   YES   NO

- Is your ship decorated with details from the culture it represents?   YES   NO

- Does your ship have at least one simple machine?   YES   NO

- Can your ship float for a period of 5 minutes or longer?   YES   NO
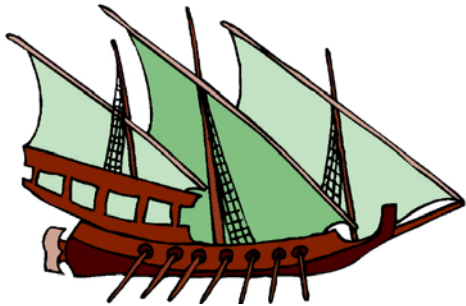
5. Evaluate your solution.

Was it the best solution? Would one of your other ideas have been better? Why or why not?

_____

_____

_____

What would you have done differently?

_____

_____

_____

Could you add to it to make it better? What would you add to it?

_____

_____

_____
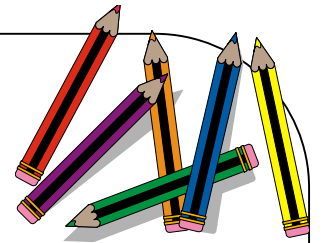
Name _____

Attach a photograph of your final project here. If you do not have a photograph, draw a picture of your final project.
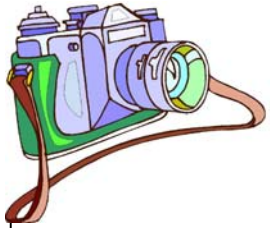
How would you make your project better? Draw a picture showing how it would look after you have made changes to it.

Rubric for *Shipping Across the Centuries*

Name_____ Date _____

Design Brief Rubric	no evidence 0	limited understanding 1	some understanding with room for improvement 2	good understanding with room for improvement 3	substantial understanding 4
The student restated the problem in his/her own words.					
The student brainstormed more than one idea.					
The student created and labeled a sketch to use as a "blueprint."					
The student included notes about problems that occurred and solutions.					
The student tested the ship to make sure					
• the hull was longer than 6 inches but shorter than 14 inches					
• the ship had at least one simple machine					
• it floated for at least 5 minutes.					
The student designed and decorated the ship with details from its culture.					
The student evaluated how he/she might have made it better next time.					

Rubric for *Shipping Across the Centuries*

Name_____   Date _____

Oral Communication Rubric	no evidence 0	limited understanding 1	some understanding with room for improvement 2	good understanding with room for improvement 3	substantial understanding 4
3.1 The student will use effective communication skills in group activities.					
a) Listen attentively by making eye contact, facing the speaker, asking questions, and summarizing what is said.					
b) Ask and respond to questions from teachers and other group members.					
c) Explain what has been learned.					
3.2 The student will present brief oral reports.					
a) Speak clearly.					
b) Use appropriate volume and pitch.					
c) Speak at an understandable rate.					
d) Organize ideas sequentially or around major points of information.					
e) Use grammatically correct language and specific vocabulary to communicate ideas.					

Standards of Learning

English (2002)

Oral Language

3.1 The student will use effective communication skills in group activities.
   a) Listen attentively by making eye contact, facing the speaker, asking questions, and summarizing what is said.
   b) Ask and respond to questions from teachers and other group members.
   c) Explain what has been learned.

3.2 The student will present brief oral reports.
   a) Speak clearly.
   b) Use appropriate volume and pitch.
   c) Speak at an understandable rate.
   d) Organize ideas sequentially or around major points of information.
   e) Use grammatically correct language and specific vocabulary to communicate ideas.

Reading

3.4 The student will use strategies to read a variety of fiction and nonfiction materials.
   a) Preview and use text formats.
   b) Set a purpose for reading.
   c) Apply meaning clues, language structure, and phonetic strategies.
   d) Use context to clarify meaning of unfamiliar words.
   e) Read fiction and nonfiction fluently and accurately.
   f) Reread and self-correct when necessary.

3.6 The student will continue to read and demonstrate comprehension of nonfiction.
   a) Identify the author's purpose.
   b) Make connections between previous experiences and reading selections.
   c) Ask and answer questions about what is read.
   d) Draw conclusions.
   e) Organize information and events logically.
   f) Summarize major points found in nonfiction materials
   g) Identify the characteristics of biographies and autobiographies.
   h) Compare and contrast the lives of two persons as described in biographies and/or autobiographies.

3.7 The student will demonstrate comprehension of information from a variety of print resources.
   a) Use dictionary, glossary, thesaurus, encyclopedia and other reference books, including online reference materials.
   b) Use available technology.

Science (2003)

Scientific Investigation, Reasoning, and Logic

3.1   The student will plan and conduct investigations in which
   a)   predictions and observations are made;
   b)   objects with similar characteristics are classified into at least two sets and two subsets;
   c)   questions are developed to formulate hypotheses;
   d)   volume is measured to the nearest milliliter and liter;
   e)   length is measured to the nearest centimeter;
   f)   mass is measured to the nearest gram;
   g)   data are gathered, charted, and graphed (line plot, picture graph, and bar graph);
   h)   temperature is measured to the nearest degree Celsius;
   i)   time is measured to the nearest minute;
   j)   inferences are made and conclusions are drawn; and
   k)   natural events are sequenced chronologically.

Force, Motion, and Energy

3.2   The student will investigate and understand simple machines and their uses. Key concepts include
   a)   types of simple machines (lever, screw, pulley, wheel and axle, inclined plane, and wedge);
   b)   how simple machines function;
   c)   compound machines (scissors, wheelbarrow, and bicycle); and
   c)   examples of simple and compound machines found in the school, home, and work environment.

History and Social Science (2001)

History

3.1   The student will explain how the contributions of ancient Greece and Rome have influenced the present world in terms of architecture, government (direct and representative democracy), and sports.

Geography

3.4   The student will develop map skills by
   a)   locating Greece, Rome, and West Africa;
   b)   describing the physical and human characteristics of Greece, Rome, and West Africa;
   c)   explaining how the people of Greece, Rome, and West Africa adapted to and/or changed their environment to meet their needs.

Economics

3.8   The student will recognize the concepts of specialization (being an expert in one job, product, or service) and interdependence (depending on others) in the production of goods and services (in ancient Greece, Rome, the West African empire of Mali, and in the present).

Standards for Technological Literacy

Standard 1:   Students will develop an understanding of the characteristics and scope of technology.

Standard 6:   Students will develop an understanding of the role of society in the development and use of technology.

Standard 7:   Students will develop an understanding of the influence of technology on history.

Standard 8:   Students will develop an understanding of the attributes of design.

Standard 9:   Students will develop an understanding of engineering design.

Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Standard 11: Students will develop the abilities to apply the design process.

Standard 18: Students will develop an understanding of and be able to select and use transportation technologies.