

Row, Tow, Pull Your Boat

Grade Three



OBJECTIVES

The students will use previous knowledge and research to analyze and solve a scenario relating to the use of simple machines and the Lewis and Clark Expedition. Students will be able to identify simple machines. They will communicate their ideas and findings and those of their group in writing, drawings, and written and oral presentations.



CLASS TIME

Three 30- to 45-minute sessions



NATIONAL STANDARDS

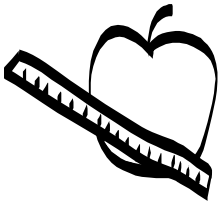
This lesson plan reflects some of the national standards of learning as defined by the National Council for Social Studies (NCSS), The National Council for Teachers of English (NCTE), the National Research Council, and the International Society for Technology in Education (ISTE). These standards are listed below:

- Social Studies: Time, Continuity, and Change
- Social Studies: People, Places, and Environments
- Social Studies: Science, Technology, and Society
- Language Arts: Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
- Language Arts: Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.
- Science: Science as Inquiry
- Science: Physical Science
- Science: Science and Technology
- Technology: Technology problem-solving and decision-making tools



MATERIALS

- 1 overhead projector
- 1 overhead transparency of each of the following:
 - “Background Information” page
 - Keelboat Nickel reverse from the Resource Guide
 - “You’re Grounded” page
 - “What Can You Do?” worksheet



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- Copies of each of the following:
 - “North America in the 1800s” map
 - “Nickel For Your Thoughts” page
 - “What’s Your Problem?” page
 - “Making Work Simple” page
- Chalkboard
- Chalk
- Manila folders
- Crayons/markers
- Construction paper



PREPARATIONS

- Make one overhead transparency of each of the following:
 - “Background Information” page.
 - Keelboat Nickel reverse from the Resource Guide.
 - “You’re Grounded” page.
 - “What Can You Do?” page.
- Make copies of each of the following:
 - “North America in the 1800s” map (1 per student).
 - “Nickel For Your Thoughts” page (1 per student).
 - “What’s Your Problem?” worksheet (1 per student).
 - “Making Work Simple” page (1 per group).



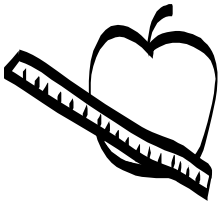
GROUPINGS

- Whole group
- Small group



TERMS AND CONCEPTS

Obverse (heads)	Commerce	Reverse (tails)	Thomas Jefferson
Lewis and Clark	Keelboat	Louisiana Purchase	American Indians
Corps of Discovery	Pirogues	Portfolio	Simple Machines
Nickel	Northwest Passage	Sandbar	Technology
Corps of Discovery	Currency		



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BACKGROUND KNOWLEDGE

Students should have a basic knowledge of:

- The Lewis and Clark Expedition
- Working in cooperative groups
- Using resources to conduct research
- Pushes and pulls

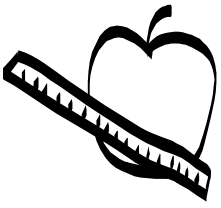


STEPS

Session 1

1. Display the overhead transparency of the “Background Information” page and read it aloud to the class. As a class, discuss the main reasons that the Corps of Discovery was sent on this expedition.
2. Distribute a copy of the “North America in the 1800s” map to each student.
3. Have the students use their fingers to trace the journey of Lewis and Clark on their maps, highlighting the fact that their trip would be by water and also by land.
4. Lead a class discussion on what kinds of problems Lewis and Clark may have encountered on this type of journey. Record student suggestions.
5. Ask the students to brainstorm about what modes of transportation Lewis and Clark may have used on their journey. Do not comment on right or wrong answers at this point.
6. Write the following on the board:

Ohio River	Blue
Mississippi River	Yellow
Missouri River	Red
Columbia River	Orange
Pacific Ocean	“X”
7. Direct students to find and color each of the bodies of water on their map, using the key on the board as a guide. They should also mark the Pacific Ocean with an “X.”
8. Explain that, starting in 2004 and continuing through 2005, our country is changing its nickels to tell the story of Lewis and Clark and their exploration of our western lands 200 years ago. Display the overhead transparency of the Keelboat Nickel reverse.
9. Explain that the boat portrayed on the nickel is a keelboat and was one of the means of transportation Lewis and Clark used on their journey. Have students discuss how the keelboat might have helped Lewis and Clark in their many missions.
10. Divide your students into groups of four to five students. Direct the students to sit in their groups.

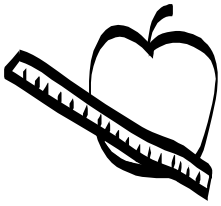


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11. Distribute one copy of the “Nickel For Your Thoughts” page to each group.
12. Ask each group to discuss why they think the keelboat was chosen as one of the new nickel reverse designs. Have each group list four reasons they think the keelboat was chosen on their worksheet.
13. Ask each group to share one or two of their explanations with the whole class.
14. Distribute a portfolio folder to each group. This folder will hold all of the groups’ important documents for the remainder of the sessions.
15. Allow the groups to use markers and crayons to decorate their portfolio with Lewis and Clark-related designs, then to place their maps and “Nickel For Your Thoughts” page in the folder.
16. Display the “You’re Grounded” overhead transparency and ask a student to read it aloud.
17. Distribute a copy of the “What’s Your Problem?” worksheet to each student. Direct the students to complete the “Problem” box by describing the problem presented on the overhead.
18. Have the students fill in the “Important Facts” box with a bulleted list of key facts about the problem. Have students place their papers in the group folder when they have finished their work.

Session 2

1. Select a student to read the “You’re Grounded” overhead transparency to the class.
2. Direct the students to assemble into their groups from the previous session. In these groups, they should share their individual “What’s Your Problem?” worksheets and begin brainstorming possible solutions. Direct the groups to record their ideas in the “Possible Solutions” box on their own pages. Have the students leave room in both boxes for future information.
3. Monitor the progress of the groups as they develop possible solutions. Facilitate group discussion without giving them any answers. When the groups seem to be at the point of needing more information or their discussion leads to the idea of using a tool to get the keelboat unstuck, begin a class discussion of what they might be able to use to get the keelboat off the sandbar.
4. Lead the class in a discussion of their knowledge of the use of pulls, pushes, and simple machines.
5. Ask groups to generate questions that they have about simple machines or how to get the keelboat unstuck. Have students record these questions in the Questions column of the “Questions and Answers” box on their worksheets.
6. Display the “What Can You Do?” overhead transparency. Select a student to read it aloud to the class. Then, give each group a copy of “Making Work Simple” and discuss the pictures.

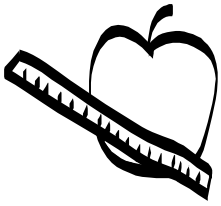


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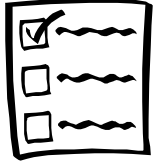
7. Have the students work in groups to discuss the new information and add it to the first four boxes on their “What’s Your Problem?” worksheet. Direct the students to record the answers to their questions in the Answers column of the “Questions and Answers” box on their “What’s Your Problem?” worksheets.
8. Direct the groups to circle their three strongest ideas from their “Possible Solutions” boxes. In the “Solutions” box, have the students describe their solution for moving the keelboat and give solid reasons why and how it will work.

Session 3

1. Direct the groups to review their “What’s Your Problem?” worksheets and to discuss and evaluate their selected solution.
2. Distribute a piece of construction paper to each group. Direct the groups to diagram their solution on the construction paper. Their diagram should include a list of needed tools and materials, a clear drawing of what is supposed to happen, and a written description of how this method will work. Inform the students that this diagram will be the center of a class presentation.
3. Have each group present its findings to the rest of the class using the group diagram. Each group member should be involved in the presentation in some way.
4. Allow the class to point out and discuss strengths and flaws in each group’s plans. Have the class decide on the solution that is most likely to succeed. Encourage the students to discuss why the selected solution would be more successful than the others in freeing the keelboat from the sandbar.
5. When all of the presentations are done, direct the groups to add their presentation diagrams to their groups’ portfolios.
6. Refer back to the students’ “What’s Your Problem?” worksheets and assess their previous findings or questions. Ask the students to record any new information on this worksheet. Also allow for students to ask any additional questions. Direct the students to add these worksheets to their groups’ portfolios.
7. Refer back to the “A Nickel for Your Thoughts” page where they listed the reasons why each group initially thought the keelboat image was chosen for the new Lewis and Clark nickel. Ask the students to assess whether or not they still feel the same. Direct them to create a new list of reasons underneath the first list, taking into account all that they have learned from their research. Direct the students to include this worksheet in their groups’ portfolios.
8. Collect group portfolios for assessment.



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ASSESSMENT

- Develop a rubric to assess each group’s skills and interactions during the problem-solving process.
- Take anecdotal notes during the portfolio development, classroom discussions, and presentations that assess their ability to work in cooperative groups.
- Develop a rubric to assess the portfolios and portfolio presentations.



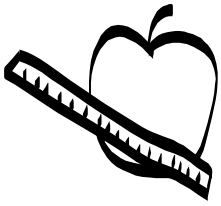
ENRICHMENTS/EXTENSIONS

- Explore the many ways American Indians used simple machines using Internet resources, such as:
 - www.canadianheritage.org/reproductions/10042.htm
 - collections.ic.gc.ca/luxton/sect_2/2d2.htm
 - www.realtime.net/~rsdcreek/mac6.htm
- Explore other ways that technology was used by Lewis and Clark during their journey. One example is when they fashioned two wagons with wheels they shaped from a cottonwood tree and axles made out of the white pirogue’s mast (Portage Creek). Lewis called them “trucks.”
- Read to the students an excerpt from a Lewis and Clark resource that refers to the many problems they had with the keelboat getting stuck on sandbars and in shallow water. Try to include readings that are specific to each of the groups’ rivers and include the methods Lewis and Clark employed to free the keelboat from the sandbar.
- Let the groups rewrite the lyrics to “Row, Row, Row Your Boat” based on their river names, how to move the boat, and so on. Have the class sing each group’s lyrics aloud.
- Have groups review the contents of the portfolio. Direct each group to design a creative way to present the artifacts that were developed during this lesson as a portfolio. Inform students they may use presentation software, design a collection box, write and act out a play, or make a group journal of the artifacts they have created. Once their portfolio presentations are completed, have the groups present their portfolios to another class, at a parent-teacher meeting, or at a similar venue.



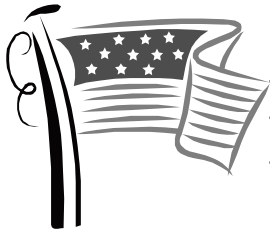
DIFFERENTIATED LEARNING OPTIONS

- Assign roles to group members that include that of reader, writer, timekeeper, and someone in the group who is responsible for making sure everyone in the group understand the tasks and findings that are presented.
- Have the students work closely with partners throughout this activity.



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- Facilitate cooperative learning rules such as helping each other, sharing, listening, and respecting the views of others. Use a rubric to assess the group that includes these skills.
- Have the students view a video of the Lewis and Clark Corps of Discovery.



Background Information

In 1803, the President of the United States was Thomas Jefferson, and the nation's westernmost boundary was the Mississippi River. West of the Mississippi was a large land area that was owned by France. The United States knew little about this area, but late that year the United States Congress approved a treaty to buy this land. This purchase, the Louisiana Purchase, doubled the size of the United States.

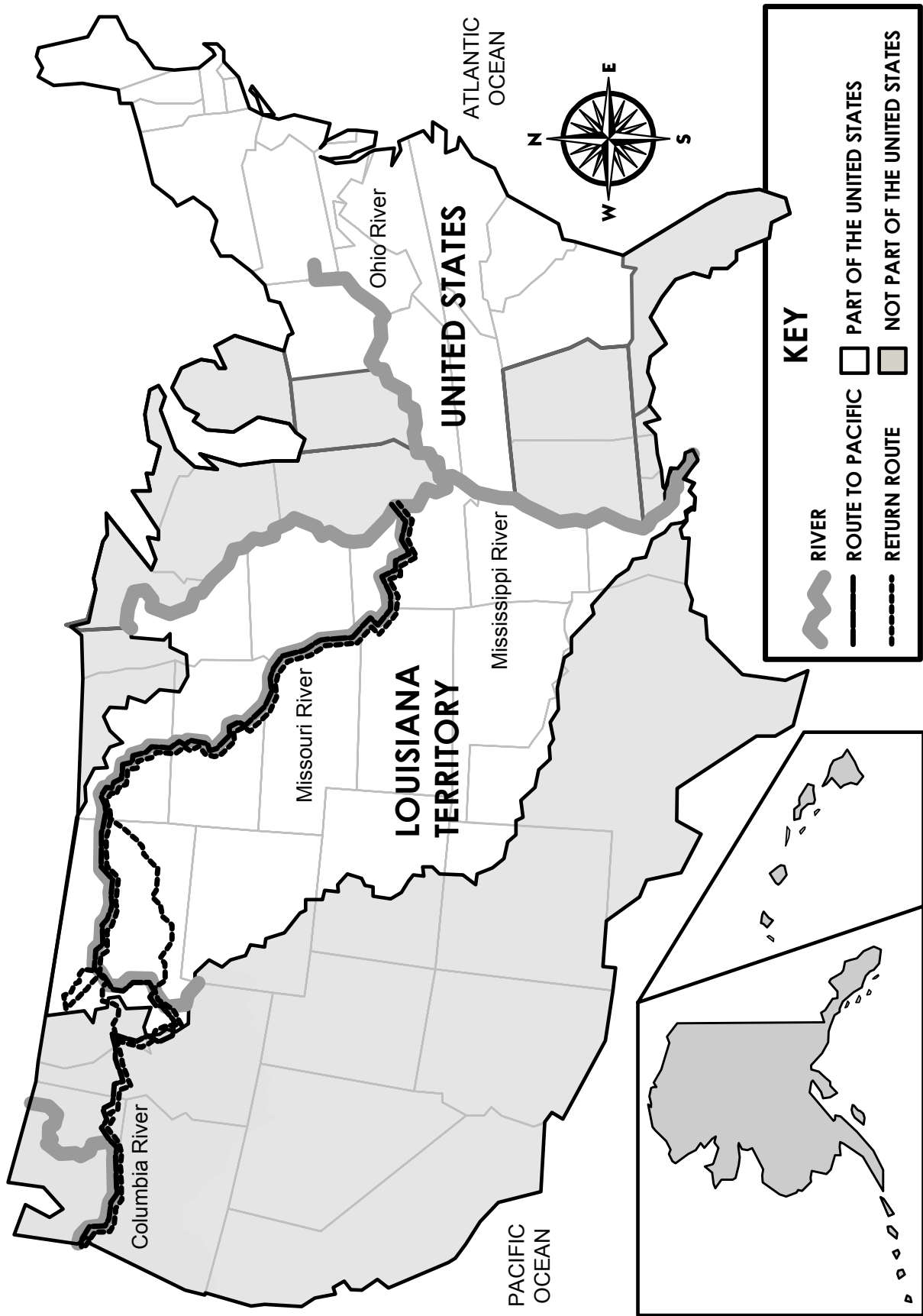
Because few Americans had ever ventured beyond the Mississippi, President Jefferson decided to send a team to explore this new land. This team, the Corps of Discovery, was led by two men named Meriwether Lewis and William Clark.

Lewis and Clark were told to study the weather, soil, plants, animals, and people living on this land. They were to establish friendly relations with any American Indian tribes that they came across. They were also sent to search for a water route or "Northwest Passage" to the Pacific Ocean.

President Thomas Jefferson wanted Lewis and Clark to find the shortest and best way to travel across the continent by water for the purposes of commerce. At this time in history, people were not sure that this was even possible.



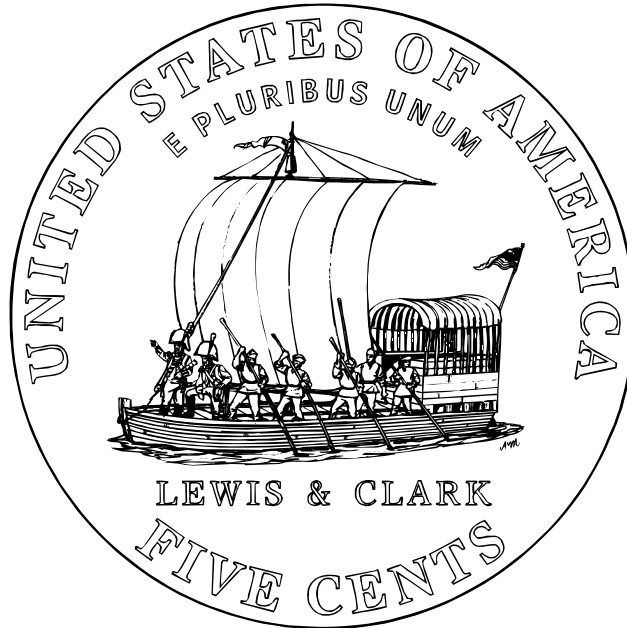
North America in the 1800s





Names _____

A Nickel for your Thoughts



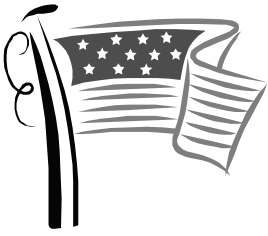
Directions: Work with your team to come up with four reasons why you think a picture of the keelboat was chosen for one of the new Lewis and Clark nickels. Remember that the Keelboat Nickel is part of the Westward Journey Nickel Series™ with connections to the Corps of Discovery.

Reason #1: _____

Reason #2: _____

Reason #3: _____

Reason #4: _____



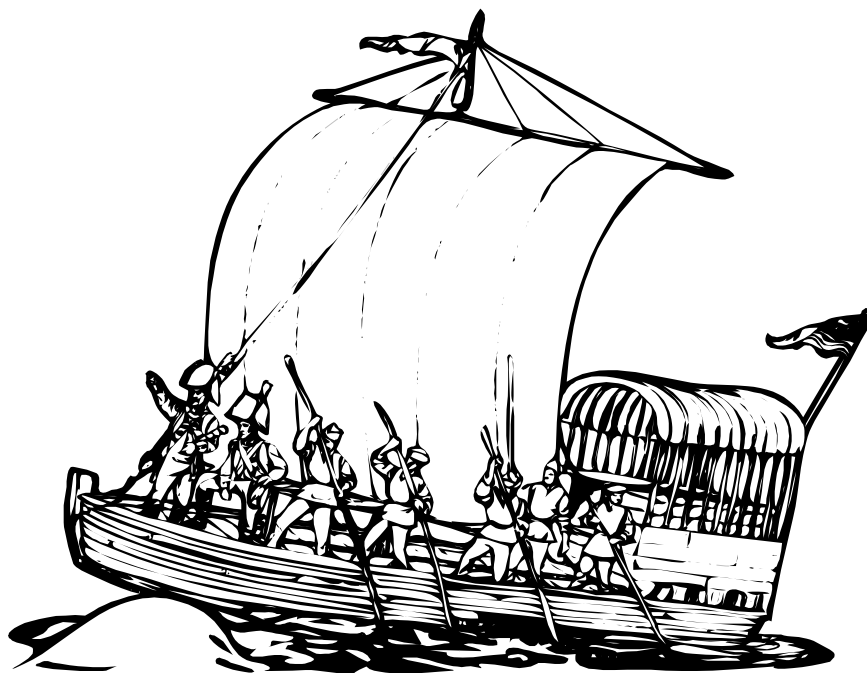
You're Grounded

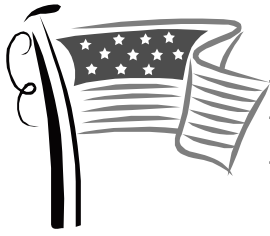
It is the year 1803. Your group has been asked by President Jefferson to find the shortest and best route by water to the Pacific Ocean starting with the great Missouri River.

On May 21, 1804, you and your group of 45 men leave St. Charles, Missouri, with a 55-foot keelboat and two pirogues. The Missouri river is very swift.

Suddenly, the keelboat becomes stuck in shallow water in the middle of a sandbar. Work as a team to solve the problem of getting the keelboat moving again.

On your "What's Your Problem?" worksheet, make a list of what you know about the problem, possible ways to solve the problem, questions and answers about ways to move the keelboat, and a final solution for the problem.





Name _____

What's Your Problem?

PROBLEM

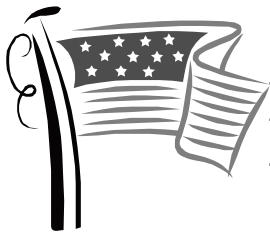
FACTS ABOUT PROBLEM

POSSIBLE SOLUTIONS

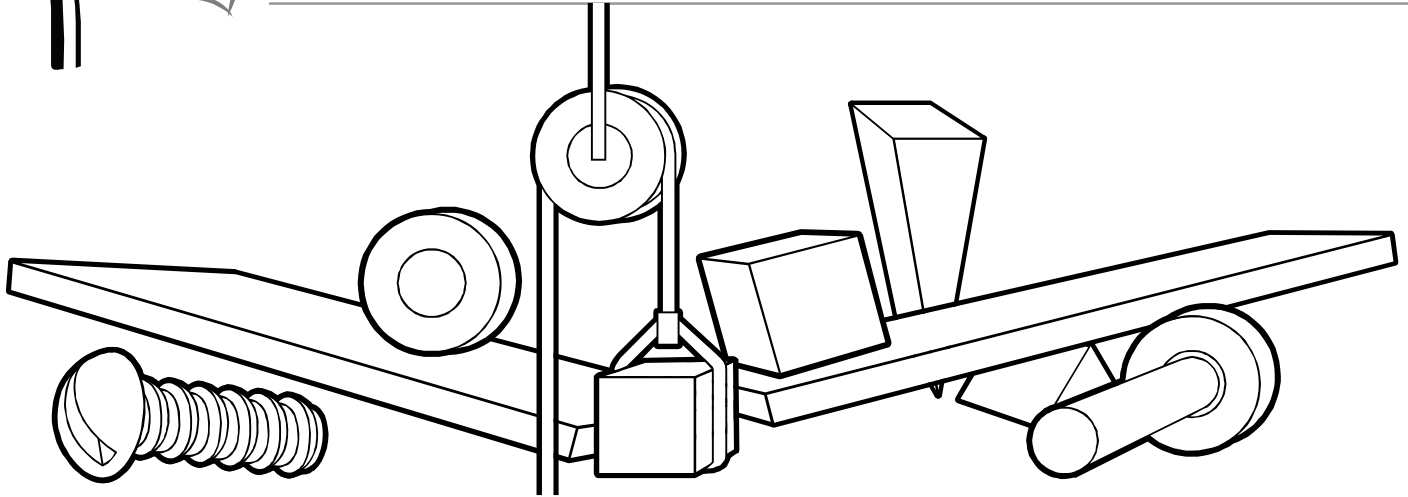
QUESTIONS

ANSWERS

SOLUTION



What Can You Do?



The keelboat is carrying 10 to 12 tons (20,000 to 24,000 pounds) of supplies. The keelboat has a square sail, 22 oars, and a cabin.

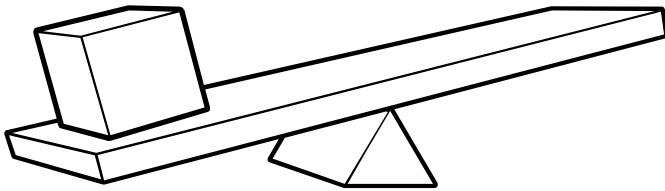
The pirogues carry 10 to 12 men. One of the pirogues has six oars and the other has seven.

QUESTIONS FOR DISCUSSION

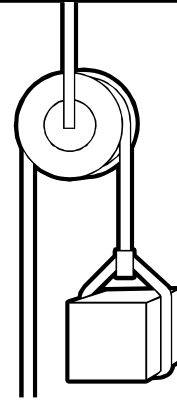
1. Do you have anything with you that help your team do the work?
2. What do we call things that help us lift, pull, push, turn, cut, and join other things?
3. Could there be something close by that would help you?



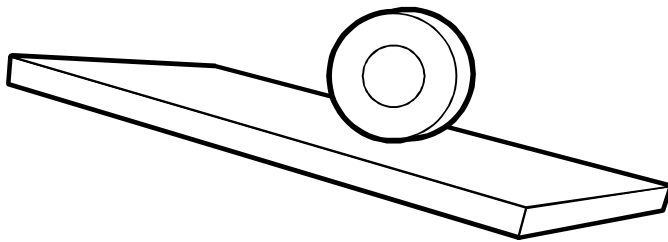
Making Work Simple



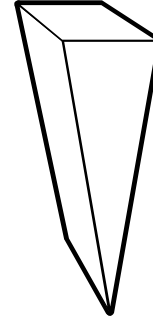
Levers help lift things.



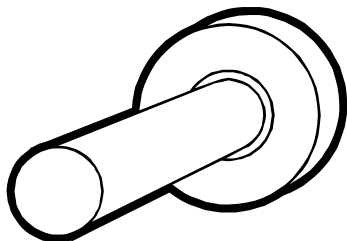
A pulley helps move something up and down.



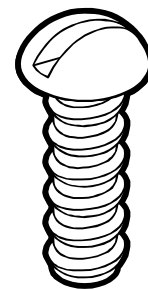
An inclined plane helps move things up and down.



A wedge helps cut or split things.



Wheels and axles help things move from one place to another.



A screw can help to raise and lower things or can hold things together.