

What is a Solar Boat?

Boats in Ancient Egypt

Boats were the most important form of transport in Ancient Egypt and vital for travel and trade. It is not surprising that the boat held much meaning to the people of Ancient Egypt, becoming an important part of religious beliefs and visions of the afterlife. It is likely that the Solar Boats were intended to be used by the deceased king in his journey across the sky. Ancient Egyptians believed that the sun-god 'Ra' navigated the sky and the underworld in a solar boat, and if you were lucky and became a member of the crew of a solar boat, you would sail for eternity in the company of gods.

Discovery

The first solar boat near the Great Pyramid of Khufu was discovered in 1954 by the Egyptian archaeologist Kamal el-Mallakh. This boat consisted of 1224 individual pieces of cedar and acacia and other materials. The work took over ten years to complete. No nails were used in the construction and the planking was assembled through a system of sewing through holes with ropes of vegetable fibers. When the wood was swollen by water, the ropes would tighten and make the boat watertight.

The solar boat measures 43.3m long and 5.9m wide. It looks like paintings and models of boats which have survived since ancient times, with a large central cabin, 9m long, an open canopy supported by poles and a smaller one at the fore which was probably for the captain's use. It was steered by five pairs of oars plus one pair at the stern to act as a rudder. The boat is now on display in the Solar Boat Museum.



Informational Sources:

Egyptian Monuments: <http://egyptsites.wordpress.com/2009/02/25/the-solar-boat-museum/>

The Solar Boat Museum <http://egyptsites.wordpress.com/2009/02/25/the-solar-boat-museum/>

Zahi Hawass <http://www.drhawass.com/blog/uncovering-second-solar-boat-great-pyramid-today>

Wind Power as an Energy Source

Wind exists because the sun unevenly heats the surface of the Earth. As hot air rises, cooler air moves in to fill the void. Ancient sailors used sails to capture the wind and explore the world. Farmers once used windmills to grind their grains and pump water. Today, more and more people are using wind turbines to produce electricity from the breeze. Over the past decade, wind turbine use has increased at more than 25 percent a year. Still, it only provides a small fraction of the world's energy.

Most wind energy comes from turbines that can be as tall as a 20-story building and have three 200-foot-long (60-meter-long) blades. These contraptions look like giant airplane propellers on a stick. The wind spins the blades, which turn a shaft connected to a generator that produces electricity.

The biggest wind turbines generate enough electricity to supply about 600 U.S. homes. Wind farms have tens and sometimes hundreds of these turbines lined up together in particularly windy spots, like along a ridge. Smaller turbines erected in a backyard can produce enough electricity for a single home or small business.

Wind is a clean source of renewable energy that produces no air or water pollution. And since the wind is free, operational costs are nearly zero. However, some people think wind turbines are ugly and complain about the noise the machines make. The slowly rotating blades can also kill birds and bats.



Information Source:

National Geographic Society <http://environment.nationalgeographic.com/environment/global-warming/wind-power-profile/>

Science and Public Policy Institute <http://sppiblog.org/>

Name: _____

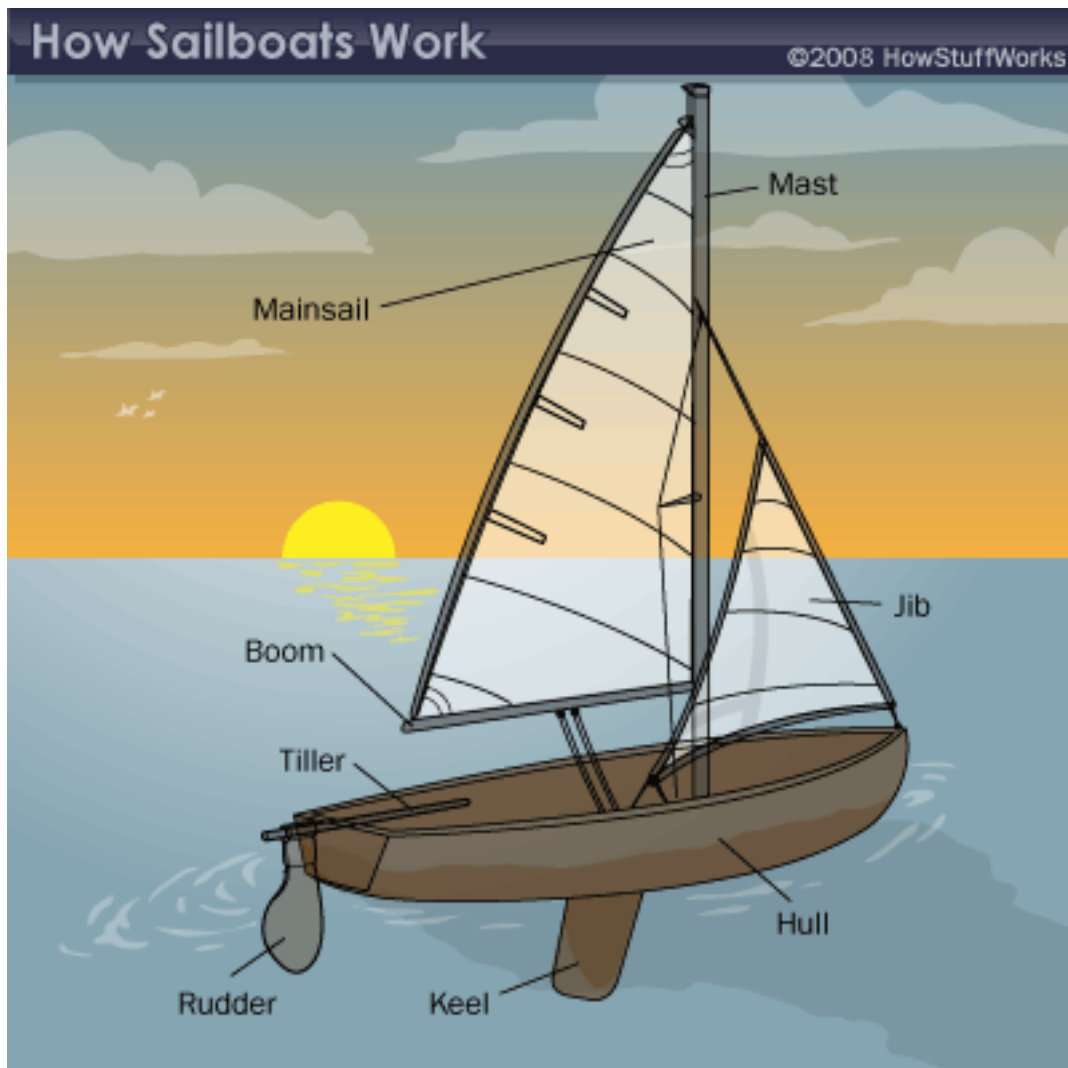
Article Summary Sheet

Which article did you read? _____

Summarize what you learned from What is a Solar Boat? Remember to use your own words.

Summarize what you learned from Wind Power As an Energy Source..
Remember to use your own words.

How Sailboats Work!



Which parts would steer the boat? _____

Which parts of the boat would catch the wind and move the boat?

Name: _____

Group Member's Names: _____

Using the Engineering Design Process

Class Question:

What is the best way to travel on the Nile River in Egypt and not use gasoline or electricity?

Step 1: **Ask** what our problem or challenge is. Write the challenge or problem here.

Step 2: **Imagine** how you can create a solution to this problem or challenge. Write ideas on how you would design your invention here.

Step 3: **Plan** by drawing what your invention would look like, and how you plan to build it. Make sure you label your parts and materials.

Step 4: **Create**: Build it!! Ask your teacher for materials that your group needs.

Step 5: **Test** your invention and then Improve on it. Do you need to add anything or change anything?

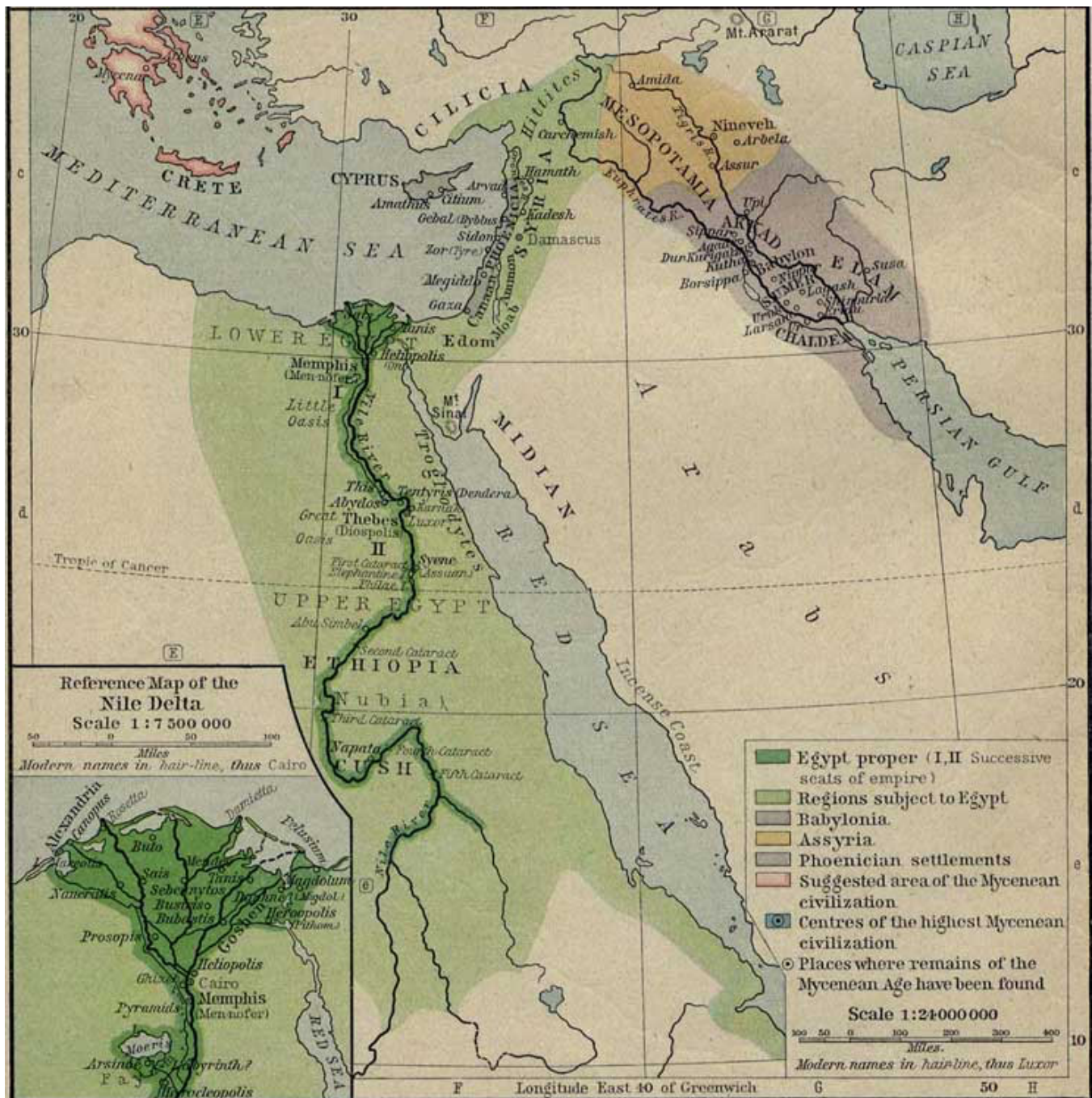
What we would change	What we would add

Step 6: Compare your invention to inventions that stayed afloat longer than yours or traveled farther.

How were they different?

How were they the same?

Ancient Egypt



Source: http://www.lib.utexas.edu/maps/historical/shepherd/mycenaean_greece_orient.jpg

Name _____

Social Studies Assessment on Egypt

Write your answers in complete sentences. You may use the word wall to help you compose your answers.

1. Just like ancient Egyptians, what source of energy was your invention using to travel?

2. Is this energy source renewable or non-renewable?

3. What are two advantages to living along a river?

4. What are two advantages to living along a sea?

5. Name two parts of a boat that would be improvements in technology over earlier boats.

Social Studies Assessment on Egypt **Answer Key**

Write your answers in complete sentences. You may use the word wall to help you compose your answers.

1. Just like ancient Egyptians, what source of energy was your invention using to travel?

The source of energy is wind.

2. Is this energy source renewable or non-renewable? **Wind is a renewable energy source.**

3. What are two advantages to living along a river? **Rivers provide drinking water, water for irrigation, fish for food, a means of traveling by boat, and a route for trade.**

6. What are two advantages to living along a sea? **Seas provide fish for food, a means of traveling by boat, and a route for trade.**

7. Name two parts of a boat that would be improvements in technology over earlier boats. **Two parts of the boat that would be improvements over earlier boats would be small and large sails, a rudder, and keel.**