Piecing it Together: Photo Mosaic Activity

Grade Level

- 3-5

Timeframe

- 1 hour

Materials

- 2 or 3 Shipwreck Layout sheets (both bow and stern sections)
- Scissors
- Paper clips
- Glue
- Labeled envelopes
- Vessel Histories (1 per student)
- Parts of a Ship diagram (1 per student)
- Site Plans vs. Photo Mosaics sheet (1 per student)

Key Words

- ROV
- Maritime Archaeology
- Photo Mosaic
- Site Plan

Activity Summary

After learning about ship components, students will work in teams to piece together individual images that make up shipwreck photo mosaics. They will then match their completed photo mosaics with those of other groups and attempt to identify their shipwrecks. Students will understand how maritime archaeologists document shipwreck sites.

Learning Objectives

Students will be able to:

- Describe how photo mosaics help archaeologists document and interpret shipwreck sites;
- Visually identify parts of a ship based on photographic evidence;
- Explain the evidence their team used to determine the type of ship they examined;
- Compare and contrast site plans and photo mosaics, tools archaeologists use to document shipwreck sites.

Background Information

Thunder Bay National Marine Sanctuary is an important location for maritime archaeologists. There are approximately 200 shipwrecks in and around Thunder Bay National Marine Sanctuary, representing every type of vessel that sailed on the Great Lakes during the "Shipwreck Century" from 1825-1925. With that many shipwrecks, Thunder Bay is a very historically significant place. Archaeologists from all over the world come to study the shipwrecks in the Great Lakes, especially the shipwreck sites in Thunder Bay.

How do maritime archaeologists study shipwreck sites? SCUBA divers dive down to the wreck to observe and record what they see. When archaeologists study a site they carefully document the shipwreck and its artifacts. That means they take many measurements, make drawings, and take pictures and video of the site. When archaeologists make a carefully measured drawing it is called a site plan. If archaeologists piece together the video or pictures from a shipwreck site, they create a photo mosaic. Photo mosaics are very useful in studying shipwreck sites because archaeologists can see exactly what the wreck looks like on the bottom of the lake.

Sometimes when a site is very deep and archaeologists can't spend as long on the site, they use remotely operated vehicles (ROVs) to take pictures and video for them. ROVs are a useful way to document a shipwreck site because they don't need air like SCUBA divers, so they can stay on the bottom a very long time.

Preparation

- Make 2 copies of each of the ship layouts on 11"x 17" paper. The drawings are cut into halves- bow (front) and stern (back).
- Cut out blocks on 1 sheet of each different ship layout (1 of each will be left uncut to be used as a key) – keep bow and stern cut-out blocks separate from one another.
- Paperclip the block pieces together and put in separate envelopes. Each should be labeled with shipwreck name and "bow" or "stern."
- Lay the second copy of the shipwreck layouts around the room. Make sure that the bow and stern sections of the same ship are not next to each other.

Learning Procedure

1. Pass out and read vessel histories to students before the activity begins.

2. Pass out "Parts of a Ship" diagram and discuss the differences between ship types. Look for features like sails, propellers, smoke stacks, etc.

3. Pass out and discuss "Site Plans vs. Photo Mosaics" sheets.

4. Break the class into groups of 3-4 students and assign each group to a specific shipwreck (bow or stern). Do not tell them what shipwreck it is.

(Procedure continued next page)

Vocabulary

ROV- Remotely Operated Vehicle. ROVs are underwater robots that help archaeologists document shipwreck sites.

MARITIME ARCHAEOLOGY- A discipline that studies human interaction with the sea, lakes and rivers through the study of vessels, shore side facilities, cargoes, and human remains.

PHOTO MOSAIC- A composite image formed from many small pictures taken of a vessel, which are then stitched together using a computer to create one large picture.

SITE PLAN- A scaled drawing of a shipwreck and its artifacts as it appears on the bottom of the sea or lake.

5. Give each group 1 paper clipped bundle of blocks matching the section of the ship they have been assigned.

6. Have students match cut pieces to the group's shipwreck layout and glue them on. When complete they should find the group with the other half of their vessel.

7. Engage students in the discussion questions below.

Discussion

Question: What type of ship did each team have and why do they think it is that type?

Possible Answers: The bulk freighter *Nordmeer*, because it does not have any masts, it doesn't have a life boat next to it, and it is not broken apart like the other ships. It also has many large hatches for lots of cargo.
The steam propeller *Pewabic*, because it has two smoke stacks for the steam engine, no masts, no life boat, and it is made of wood. It also has a large hole in the deck where salvagers took out the copper cargo.
The wooden schooner *Windiate*, because it has masts, the deck and hatch covers are still there, and the lifeboat is sitting next to the wreck.

Question: How do archaeologists use photo mosaics to better understand shipwreck sites?

Possible Answers: Photo mosaics allow archaeologists to see a lot more detail than if they took just one picture. When archaeologists are diving, they can only see a little of the wreck at a time. By creating a photo mosaic, they can study the whole thing, but still see all the detail they did when they where up close.
Archaeologists also use photo mosaics to document deep wrecks because divers have very limited time to measure and draw the sites.

Question: What is the difference between a site plan and a photo mosaic?

Possible Answers: Site plans are carefully measured drawings made of shipwreck sites. Photo mosaics are made of many small pictures put together to make a large picture of shipwreck sites.

Wrap-Up

Review the differences between site plans and photo mosaics. Explain that archaeologists often use both to fully document and interpret a shipwreck site. Taking pictures of a site is a great way to document how shipwrecks look on the bottom. By taking only pictures and leaving only bubbles, we all can ensure the preservation of these amazing underwater treasures.

Resources

- Visit thunderbay.noaa.gov and the Alpena County Library for information about the shipwrecks of Thunder Bay and further education.
- Visit sanctuaries.noaa.gov for information about the Maritime Heritage Program and other National Marine Sanctuaries.

For More Information

This lesson was developed by NOAA's Office of National Marine Sanctuaries. If you have any further questions or need additional information, email sanctuary.education@noaa.gov.

Education Standards

National Education Standards	• Science: Science as Inquiry – Understanding about scientific inquiry • Science: Unifying Concepts and Processes – Evidence, Models, and Investigation • Science: Science and Technology – Understanding about Science and Technology
Ocean Literacy Principles	• 6 – The ocean and humans are inextricably interconnected. (c) • 7 – The ocean is largely unexplored. (a, d)