

Education

Putting the Pieces Together: Shipwreck Photomosaics



Photomosaic of the *Monitor's* turret,
Courtesy NOAA

Grade Level

- 4-6

Timeframe

- 1 hour or less

Materials

Photomosaic copy, scissors, tape

Key Words

Maritime Archaeologist,
Photomosaic, Site Plan, ROV

Activity Summary

This lesson focuses on how archaeologists document and survey a shipwreck.

Learning Objectives

To recognize the importance of understanding the science of archaeology

National Standards:

Science K-4: Science Inquiry, Science and Technology, and Science as a Human Endeavor

Background Information

How do maritime archaeologists study shipwreck sites? One way is for SCUBA divers to 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 photomosaic. Photomosaics are very useful in studying shipwreck sites, because archaeologists can see exactly what the wreck looks like on the bottom of the ocean or lake.

Sometimes when a shipwreck site, such as the *Monitor*, is very deep water and archaeologists cannot spend a long time underwater 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 do not need air like SCUBA divers, so they can stay on the bottom for a very long time.

In 1974, National Geographic and the *Monitor* National Marine Sanctuary created a complete photomosaic of the wreck of the USS *Monitor*. Photos of small sections of the sunken ironclad were joined together to form a detailed image of the entire wreck site. The task of fitting all the images together was a difficult and lengthy process, but the product has provided invaluable information for the scientists and managers that study the site.

From the early 1990s to 2002, archaeologists recovered numerous artifacts from the *Monitor*, including the steam engine, propeller, cannons and its famous rotating gun turret. With all the changes to the site, it was imperative that an updated photomosaic be created to document the changes and status of the wreck site. In the summer 2006, the MNMS worked with the University of Rhode Island and the Institute for Exploration to create a new partial photomosaic of the *Monitor*.

Teacher Preparation:

Download and make copies of the *Monitor* photomosaic for each group:
http://monitor.noaa.gov/publications/education/mosaics/mosaic_image.jpg
Make copies of the *Student Activity* page. Be sure to retain one original copy of the photomosaic for comparison.

Activity:

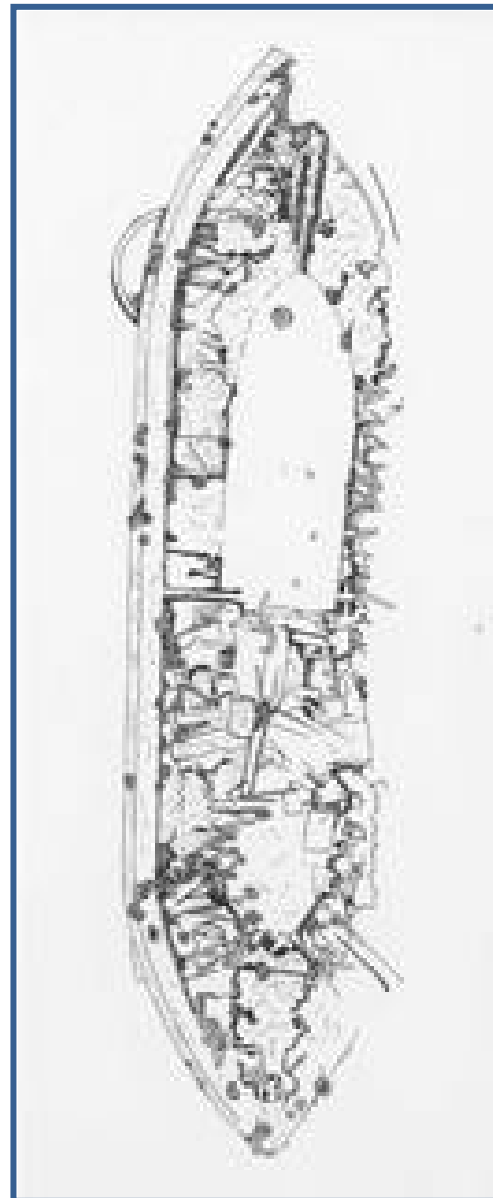
Students follow the instructions on the *Student Activity* page to create their own photomosaic puzzle.

Suggested Discussion Questions:

1. How might archaeologists use photomosaics to understand shipwrecks?
2. What was most difficult about putting the puzzle pieces together?
3. What would have made it easier?
4. Describe the process for how you identified parts of the ship using the site plan.
5. What factors may have caused deterioration of the *Monitor*?

Suggested Extensions:

1. Create your own mosaic by taking many pictures of any item. Then overlap images to put them together to make one big picture.
2. Send an email or letter to the Monitor NMS to find out more about the *Monitor's* status and other archaeology expeditions.
3. Visit the Battle of the Atlantic website to learn how an ROV helped to identify an unknown World War II shipwreck.
<http://sanctuaries.noaa.gov/missions/battleoftheatlantic2/>



Top: 1977 illustration of the site plan of the USS *Monitor*, Courtesy NOAA

Left: Artist illustration of the USS *Monitor* in 1977, Courtesy NOAA

Vocabulary

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

Photomosaic—an image composed of many smaller photographs

ROV— Remotely Operated Vehicle. Underwater vehicle that is operated remotely from a ship through a tether and does not carry a crew. ROVs help archaeologists to document shipwreck sites.

Site Plan—a scaled drawing of a shipwreck and its artifacts as it lays on the bottom of the sea or lake

Resources

Books:

Adams, Simon: *Titanic (DK Eyewitness Books)*. DK Children, 2009, ISBN-13: 978-0756650360.

Cerullo, Mary M.: *Shipwrecks: Exploring Sunken Cities Beneath the Sea*. Dutton Juvenile, 2009, ISBN-13: 978-0525479680.

Platt, Richard: *DK Eyewitness Books: Shipwrecks*. DK Children, 2005, ISBN-13: 978-0756610890.

Smith, K.C.: *Exploring for Shipwrecks (Watts Library)*. Franklin Watts, 2000, ISBN-13: 978-0531164716

Wall, Julia: *Mapping Shipwrecks with Coordinate Planes (Real World Math: Level 5)*. Capston Press, 2011, ISBN-13 978-1429666176.

Acknowledgement

This lesson was developed by NOAA's Monitor National Marine Sanctuary from Thunder Bay National Marine Sanctuary's Seeing the Bigger Picture activity. This lesson is in the public domain and cannot be used for commercial purposes. Permission is hereby granted for the reproduction, without alteration, of this lesson on the condition its source is acknowledged. When reproducing this lesson, please cite NOAA's Monitor National Marine Sanctuary as the source, and provide the following URL for further information:

<http://monitor.noaa.gov/education>. If you have any further questions or need additional information, email Shannon.Ricles@noaa.gov

Web Sites:

Monitor National Marine Sanctuary

Visit the 150th anniversary website to learn more about the sailors who died and the efforts taken to identify them.

<http://monitor.noaa.gov/150th>

Thunder Bay National Marine Sanctuary

With over 200 shipwrecks in the Thunder Bay NMS, maritime archaeologists are continuously documenting the sites for future study. Visit Thunder Bay's education site to download photomosaic images, site plans, and lesson plan to delve deeper into the underwater world of shipwrecks.

Lesson Plan:

<http://thunderbay.noaa.gov/pdfs/piecetotherteacher.pdf>

Materials:

http://thunderbay.noaa.gov/pdfs/photo_mosaic_activity_materials.pdf

NOAA's National Marine Sanctuaries: Photomosaic Gallery

Here you will find examples of photomosaics created for the various shipwrecks located in some of the national marine sanctuaries.

http://sanctuaries.noaa.gov/missions/2006fknms/photomosaic_gallery.html

Immersion Learning: Mapping Shipwrecks

Online interactive activity where you choose any one of five shipwrecks and then try your hand at pieces together its photomosaics.

http://www.immersionlearning.org/index.php?option=com_wrapper&Itemid=215

Putting the Pieces Together—Student Activity Page

Name: _____

Date: _____

USS Monitor 1974 Photomosaic

Download larger image at
http://monitor.noaa.gov/publications/education/mosaics/mosaic_image.jpg

Images Courtesy NOAA

Photomosaics

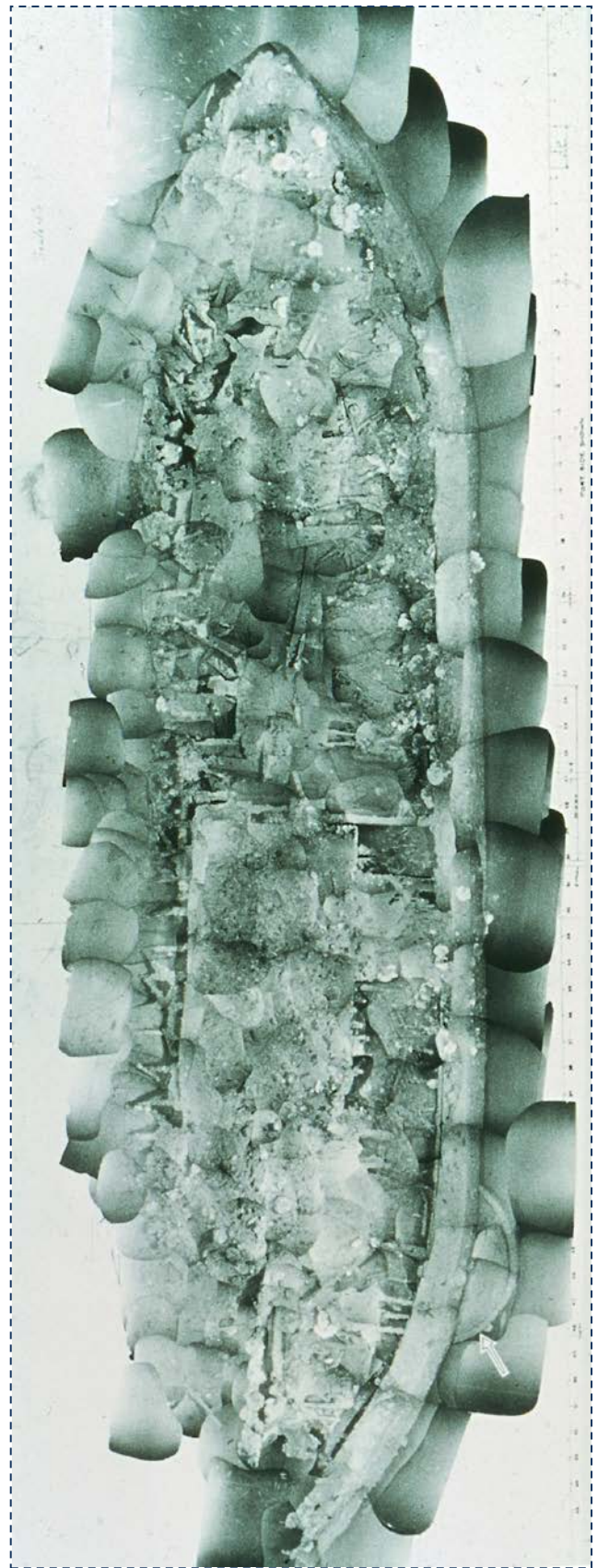
A photomosaic is an image created by piecing together hundreds of other images from photos or video. The photomosaic allows maritime archaeologists to document and survey shipwrecks more clearly.

Activity:

1. Using scissors carefully cut around the dotted lines of the mosaic.
2. Cut apart the mosaic into 5-10 puzzle pieces.
3. Exchange your puzzle pieces with another group.
4. Look carefully at the other group's puzzle pieces and complete the puzzle.
5. Use tape to hold the pieces together.
6. Compare your puzzle to the original image.
7. Does your puzzle look the same or different?
8. Compare the photomosaic to the site plan.
9. Using the *USS Monitor 1974 Site Plan*, identify various parts of the ship on the photomosaic.

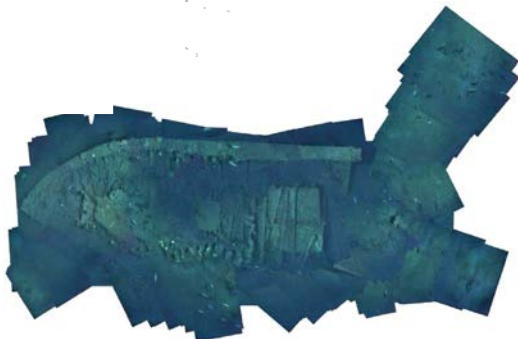
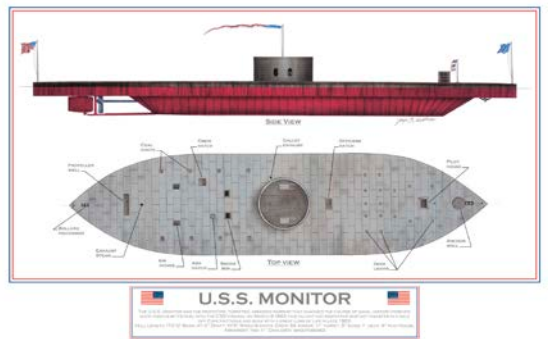
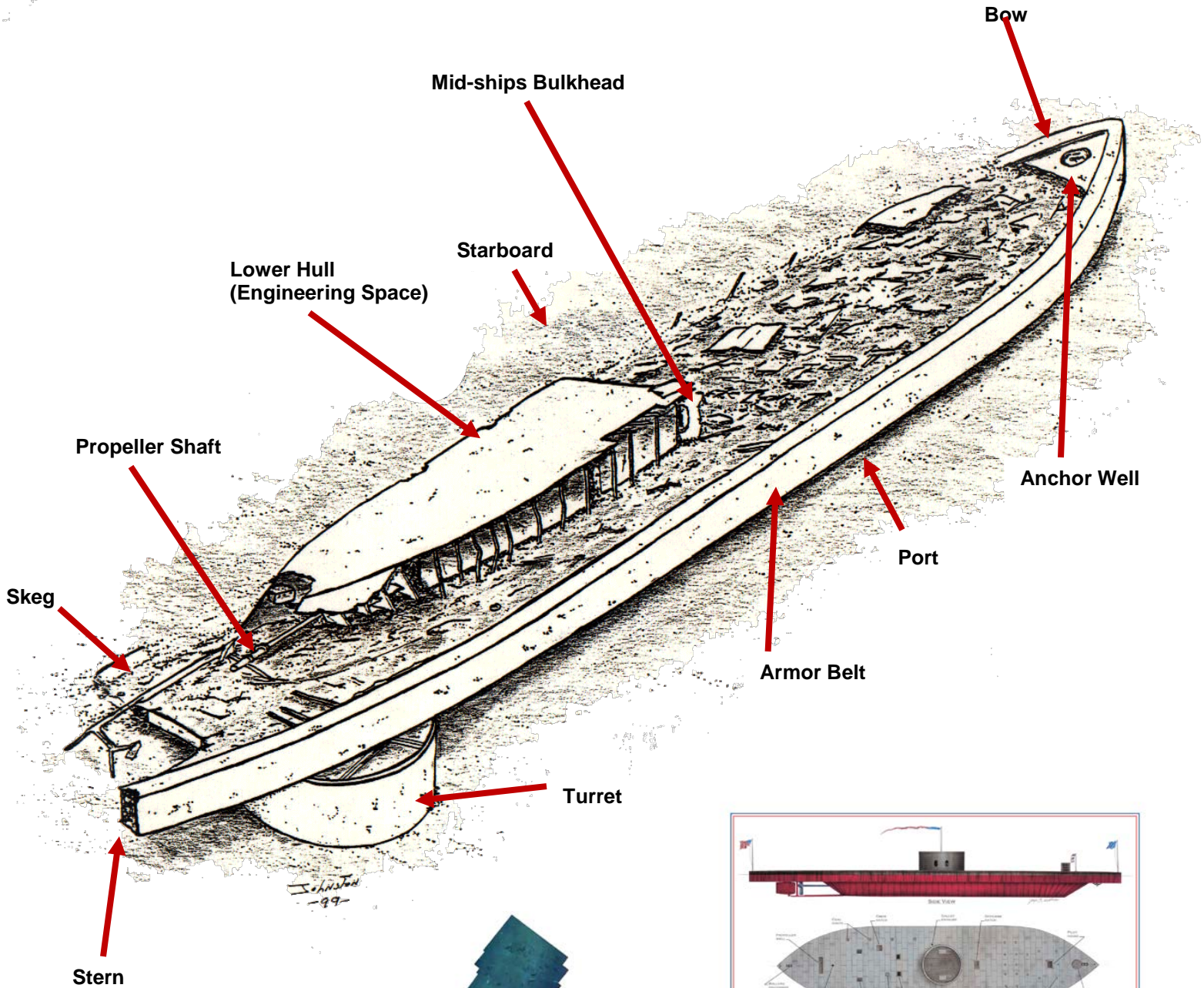
Discussion:

1. How might archaeologists use photomosaics to understand shipwrecks?
2. What was most difficult about putting the puzzle pieces together?
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USS Monitor 1974 Drawing

The USS *Monitor* sank on December 31, 1862. When the ship sank, she flipped upside down. The turret fell off and the ship landed on top of the turret. In 1974, the drawing below shows that much of ship was intact, but there were many areas of collapse and deterioration.



2006 Photomosaic