The following lessons were created by **Randall Colton**, a teacher participating in the National Endowment for the Humanities Summer Institute for Teachers entitled Touch the Past: Archaeology of the Upper Mississippi River Region.

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Submerged Secrets

Grade level: 4-12

Subject areas: Social Studies, Geography

Objectives:
Through an inquiry, students will use pieces of "evidence" within "contexts" to develop "interpretations" from what they observe and investigate in an activity that uses Great Lakes shipping as a model for processes used in deriving a story about the past.

Standards:
From the Wisconsin Department of Public Instruction's Social Studies Standards:
Geography:
> A.4.1. Use reference points.
> A.4.2. Locate physical features.
> A.4.4. Human-environment interactions.
> A.4.5. Use geography references to gather information.
> A.4.6. Identify environmental changes, predictable and unpredictable.
> A.4.7. Identify connections between local and away places.

History:
> B.4.1. Examine primary and secondary resources to understand the past.
> B.4.8. Compare past and present technologies.

Duration: Five 30-minute class periods/

Materials/Supplies:
Websites
Background information about the ship, *Christina Nilsson*:
http://wisconsinshipwrecks.org/Vessel/Details/99?region=Index
and
http://www.maritimetrails.org/research-shipwrecks-results.php?VESSELNAME=Christina+Nilsson&VESSELTYPE=&TRAIL=&COUNTY=&CASUALTYDATE=&NEARESTCITYTOWN=&Search=++Search+Shipwrecks++&WADbSearch1=Submit
Door County Shipwreck Guide:
aqua.wisc.edu/publications/ProductDetails.aspx?productID=432
Nautical charts 14901 and 14902 of Lake Michigan from:
www.nauticalchartsonline.com
Map of St. Lawrence Seaway ports:
www.worldportsource.com/waterways/systems/maps/Great_Lakes_Saint_Lawrence_Seaway_22php
Simple online GIS software: www.scribblemaps.com

Materials
Book: *Digging and Discovery – Wisconsin Archaeology*
Book: *Working with Water – Wisconsin Waterways*
Nautical chart 14902 of Door County
Adhesive dots

Background:
There has been much Great Lakes shipping over the past 300 years. Unfortunately for some sailors and investors in this enterprise, there have been losses of life, cargo, and vessels. The locations for many of these vessels have been established, and they may provide time capsules for further understanding of Great Lakes commerce and Great Lakes maritime history when examining shipwrecks along with concomitant artifacts, records, and settings. Records and settings help to establish "contexts" for figuring out what roles these ships played in everyday life during their periods of use. The area of "Death's Door," near the tip of Wisconsin's Door County, is a location that has played host to ship sinkings, because of a narrow shipping corridor with many nearby hazards to shipping. Late autumn was a risky season for shipping on the Great Lakes, when strong storms could overwhelm a ship's capability to safely navigate.

Vocabulary:
archaeology
evidence
context
interpretation
shipwreck
artifact
site
latitude / longitude
navigation
bathymetry
meteorology
primary source
secondary source
hazard
gale

Setting the Stage:
Day 1: In a class-wide discussion, ask students about ways to solve mysteries: "You find something you have never seen before. How do you find out what it may be?" Identify "observation" and "research," and then "conclusion" as parts of an investigative progression. Be deliberate in reviewing the processes students generated; list them. Student ideas could have parallels in the activities below.

Procedure:
Day 1 (continued): Share with students: "Oh my, a shipwreck was discovered in Lake Michigan, just east of Door County." Share shipwreck images from www.maritimetrails.org. (Ahead of time, go into the website and click on blue-highlighted "Wisconsin Shipwreck Database", then click on the "Search Shipwrecks" picture. After that, type the ship name *Christina Nilsson* in the top box. On the next web page click on the ship name, which will take you to yet another page that has underwater photos of the ship that you can click on.) Show only the photos, not the drawing that was created. To students: "What do you see? How can you learn more about what is at this underwater site?"

For homework, assign readings from *Digging and Discovery: Wisconsin Archaeology*, pages 1-8 and 71-72.

Day 2: For 15 minutes, have students work in groups of 3-4 individuals to generate what things could help them to figure out more about this mystery ship and how it came to rest on the lake bottom. Following this, in a whole class discussion, make two classroom lists: "questions," and "methods of investigation." Explain to students that they have begun a process of "archaeological" exploration.

Next, share and list archaeology field and research methods with students: careful methodical removal of obstacles and layers; documentation (writing, drawing, and imaging) and measurements of what is revealed – both artifacts and their surroundings; close examinations of "artifacts"; noting the immediate and wider area geography and conditions – biota, geology, climate and weather, water behavior during different weather and water conditions; personal accounts that could pertain to the sinking; news media; related commercial enterprises. Explain that finding such information helps in understanding the "contexts" of an archaeological site, and that from contexts it may be possible establish connections and to derive patterns to more accurately develop an "interpretation" of a location in a larger sense geographically (historically, economically, socially, environmentally). Which of the preceding research would be involved with "primary sources," and which with "secondary sources?"

For homework, assign readings from *Working with Water – Wisconsin Waterways*, pages 30-37, 40, 41-52.

Day 3 and Day 4 (start this section, and then finish it the next day): Search for answers! Give students a nautical chart of Door County peripheral waters, chart 14902 from www.nauticalchartsonline.com. Give students the coordinates for the shipwreck, found on the website www.wisconsinshipwrecks.org (click on "explore shipwrecks"; then click in the box surrounding Door County; then click on the dot for the Christina Nisson; then click on the blue-highlighted "mooring buoy"; then note the longitude/latitude for the shipwreck). Have students use them to locate the position on the nautical chart. Mark the spot with an adhesive dot. "What do you notice about the "bathymetry" and potential ship "hazards" in the area? Why would a ship be in such a place? What more would you like to know for a more complete understanding of why the ship sank?" Provide answers from the diving card and websites provided in the **Materials** section above. "What methods could have provided information for your questions?"

Explain to students that the many avenues of research which go together to provide

"context" for a shipwreck, in the end may provide a fairly comprehensive story about a ship: why it was built: how, when and where it was used; who served on it; and finally, the circumstances that led to its sinking.

Closure:
Day 5: Read and share background provided in *Great Ships on the Great Lakes*, pages 104-119. Stop at points in the chapter for discussions of connections students notice with what they have learned so far about underwater archaeology.

Evaluation:
Day 5: Finally, assign students a drawing and writing assignment as an evaluation of what they have learned about how to comprehensively research an underwater archaeological site. In this assignment, students should create an illustrated book with labels and explanations, taking the reader from first discovery of a shipwreck, to ways to learn about the vessel, to understanding the ship's story in its historical setting. Allow students 5 days to complete this.

Extensions:
1. Apply similar investigations to numerous shipwrecks noted in the sources in the references section below.
2. Plot Great Lakes shipwreck sites on a map. Note clusters, and research the settings for what could have caused these "hot spots." Rocks? Shallows? Currents? Seasonal weather events? Shipping routes?
3. In a follow-up classroom activity, simulate processing an underwater archaeological site, for which the beginning of the lesson is provided below:

Day 1: Before students arrive – on a floor space, with masking tape outline a shape of a ship hull, about 3' X 14". Place artifacts within or just outside the hull boundaries. Then cover the "ship" with a blanket/tarp, allowing part of the hull and/or an "artifact" to be seen.

Students see the prepared floor space for the first time. Would they like to investigate? Tell them that this floor space is an underwater location. What do they notice that is exposed? Ask them what they think this could be. Maybe some more of the covering needs to be moved to consider what is there?

Have everyone step back and ask students ways to examine the "site" so that all clues may be considered in deciphering what is there. Discuss how an underwater site poses some challenges not encountered at a land site. How could these be

addressed to minimize them? Note student ideas, and then introduce some fundamental archaeological procedures for examining a site in a methodical way. Create a grid with taped-down string, with 4' X 4' quadrats on opposite sides of the shipwreck centerline, continuing successively the length of the shipwreck. The squares will extend one foot outside all edges, where some artifacts might rest. Label each quadrat. Using tape measures, record the distance to each artifact from the centerline corners of each quadrat. Then sketch, using 8" X 8" paper, with the measurements at a proportional scale, what was seen at each quadrat. Label each paper to correspondent with respective ship quadrat.

Proposed materials:
-"artifacts": 2 mugs, a fork, pieces of coal, snapped rope, coins, watch, tools, bottle, enlarged picture of a sextant, and/or any other notions
-a bed sheet or a colored tarp the same size
-8" X 8" drawing paper (cut to size) and pencil
-theme paper and clipboards
-tape measure
-string
-roll of ½ inch tape

References:
Print references
Broihahn, John H.; Rosebrough, Amy; Thomsen, Tamara; Rausch, Leah; Meverden, Keith. "Division of History Preservation-Public History at the Wisconsin Historical Society". *The Wisconsin Archeologist*, Volume 95, Number 1, January-June 2014. pp. 112-117.

Holliday, Diane Young; Malone, Bobbie. *Digging and Discovery: Wisconsin Archaeology*. Madison, Wisconsin. State Historical Society of Wisconsin, 2000. pp. 1-8, 71-72.

Malone, Bobbie; Gray, Jefferson J. *Working with Water – Wisconsin Waterways*. Madison, Wisconsin. Wisconsin Historical Society Press, 2001. pp. 30-37, 40, 41-52.

Green, Catherine M.; Gray, Fefferson J.; Malone, Bobbie. *Great Ships on the Great Lakes*. Wisconsin Historical Press, 2013. pp. 104-119.

Kohl, Cris. *The Great Lakes Diving Guide*. Seawolf Communications Inc, 2001.

Macauley, David. *Motel of the Mysteries*. HMH Books for Young Readers, 1979.

Macauley, David. *Ship*. Boston: Houghton Mifflin Company, 1993.

Smith, K. C.; Douglas, Amy. *History Beneath the Sea – Nautical Archaeology in the Classroom*. Society for American Archaeology, Public Education Committee, 2001.

Websites
Backgrounds and stories of some Wisconsin shipwrecks
    http://www.wisconsinshipwrecks.org/
Shipwreck guides for purchase
    http://aqua.wisc.edu/publications/productslist.aspx?CategoryID=24&selection=7
Organization with shipwreck references and an annual festival
    http://www.ghostships.org/
Wisconsin Underwater Archaeology Association
    http://www.wuaa.org/
Nautical charts
    http://www.charts.noaa.gov/InteractiveCatalog/nrnc.shtml
Nautical charts and shipwreck records
    http://www.nauticalcharts.noaa.gov/hsd/wrecks_and_obstructions.html
Geographic information systems (GIS) data on shipwreck sites
    http://www.arcgis.com/home/webmap/viewer.html?featurecollection=http%3A%2F%2Fwrecks.nauticalcharts.noaa.gov%2Farcgis%2Frest%2Fservices%2Fpublic_wrecks%2FWrecks_And_Obstructions%2FMapServer%3Ff%3Djson%26option%3Dfootprints&supportsProjection=true&supportsJSONP=true
Hydrography and nautical charts, information
    http://www.nauticalcharts.noaa.gov/
Shipwreck sites
    lakesuperiormagazine.com/cat/wreckmaplm.html
Background on Wisconsin shipwrecks
    www.maritimetrails.org

Also consider references about:
Ship design
Historical meterological data on wind
Water dynamics of Great Lakes waves