



The Evolution of Shrimping Vessels

Focus on Inquiry

Students will:

- explore the history of shrimping vessels due to the increased demand from the seafood industry.
- examine the changes that include the shape, the construction material, the engine, navigation equipment, and other aspects.

Lesson Content Overview

This lesson will explore how shrimping vessels changed over time to meet the needs of shrimping production and how technology played a role in the changes. Throughout this lesson, students will discuss what changes have occurred over time and how these changes have impacted shrimp production. Lastly, students will analyze how these changes have affected the environment and the role they will continue to play.

Duration: Two to three 90 minutes class (or three to four 45 minutes classes)

Setting: Classroom

Grouping: Various grouping throughout the lesson

Grade Level: Middle School (Grades 6-8)

Louisiana Social Studies Standards – Middle School

Standard	Description
6.1.4	Identify and compare measurements of time in order to understand historical chronology.
7.1.4	Interpret and construct timelines of key events, people, and ideas.
8.1.2	Construct and interpret a timeline of key events in Louisiana history and describe how they connect to U.S. and world events.
8.10.3	Describe historical factors including the economic growth, interdependence, and development of Louisiana.

Louisiana Science Standards -- Middle School

Standard	Description
6-MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
7-MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

8-MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
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Louisiana English Language Arts Standards -- Middle School

Standard	Description
Writing 6.1, 7.1, 8.1	Write arguments to support claims with clear reasons and relevant evidence.
Speaking and Listening 6.1, 7.1, 8.1	Engage effectively in a range of collaborative discussions with diverse partners on grade-level topics, texts, and issues, building on other's ideas and expressing their own clearly.

Louisiana Math Standards -- Middle School

Standard	Description
6.RP.A.3	Use ratios and rate reasoning to solve real-world and mathematical problems.
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.

Prior Knowledge Needed by Students

- Analyzing nonfiction text
- Calculating percentages

Materials

- Vocabulary (provided)
- Coffee filters, pipe cleaners, string, mesh bags, pantyhose/stockings, etc.
- Five large rubber bouncy balls, ten marbles (two different colors), three golf balls, four pairs of dice, and ten very small pebbles (smaller than the marbles), etc.
- Buckets or deep trays to hold water
- Paper towels
- Number of Shrimp Caught Data Chart (provided)
- Shrimping net images (provided)
- Video: History of Shrimp Fishery of the Southeastern US (https://youtu.be/igU6_2f32nI)
- Evolution of Shrimping Vessels Images (provided)
- Evolution of Shrimping Vessels documents (pre-1920s, the 1920s-1930s, 1940s to 1950s, 1960s to 1970s, and 1980s to 2020s) (provided)
- Shrimping Locations Images (provided)
- Venn Diagram (provided)

Background Information for Teachers

Shrimping has a long history in Louisiana. The shrimping industry is one of the largest fisheries in the United States. According to ArcGIS (2021), over 70% of all domestic shrimp are harvested in the Gulf of Mexico. Since the earliest settlements, fishermen took advantage of Louisiana's marshes and estuaries. In the late 1700s, fishermen used fishing nets and small skiffs to catch shrimp in shallow waters of coastal lakes and bays. These shrimp were mainly sold fresh to local markets due to the lack of refrigeration and ice. The earliest boats used for shrimping resembled the vessels used in the Mediterranean. These boats were fitted with a centerboard and could operate in shallow waters. The larger offshore boats were introduced in 1938 by Florida

fishermen. These vessels are typically 50 to 65 feet long with deep drafts and refrigeration, which was necessary as fleets went further offshore. These large shrimp boats are frequently equipped with two tow nets. A third boat type is the Lafitte skiff and is used for shrimping on the Louisiana coast. These vessels use a semi-V hull with a more sheer and flared bow section than a traditional skiff. These boats can operate efficiently in lakes and bays of inland coastal waters and are equipped with small otter trawls or wing nets. Boats commonly used today evolved from these early boats.

In the late 1800s, the haul seine net was used on shrimp boats. Crews of eight to twenty men would man the vessel and use smaller skiffs to set the 1,800-foot nets. In 1917 the otter trawl, which is still used today, was introduced to Gulf Coast shrimpers. This trawl expanded the fisherman's range by enabling deeper fishing and decreasing the manpower needed to two or three. Around 1933, shrimpers in the bayous of Terrebonne Parish started using the night trawl or butterfly nets. This net was used in shallow water at night when shrimp are near the surface of the water. These nets are typically found on small luggers, Lafitte skiffs, or attached to docks along the waterway banks.

Engage (45-55 minutes)

- 1) Begin by introducing (or reviewing) the different components of a shrimping vessel (Shrimping Vessel Vocabulary provided).
- 2) Create a trawl:
 - Using what they know so far about a trawl, students will create their own using the supplies provided. The supplies can include coffee filters, pipe cleaners, string, mesh bags, pantyhose/stockings, etc. Students will create a trawl that will catch the “shrimp” but not other creatures like sea turtles, sharks, and fish.
 - Have students brainstorm ideas and sketch concepts for net designs prior to construction. Students will collect the materials provided by the teacher and construct their net.
 - After the students have constructed their nets, students will be divided into groups of four. The teacher will place various different items in a tray/buckets full of water (each group will get one). These items can include five large rubber bouncy balls, ten marbles (two different colors), three golf balls, four pairs of dice, and ten very small pebbles (smaller than the marbles), etc.
 - Students will create a chart in their notebooks or the teacher will provide students with the data chart.
 - Each student will close their eyes and will attempt to capture their “shrimp” in their net. Students only get two sweeps to collect their “shrimp”. After the second sweep, students will record the number of each item collected in their net. The items will then be placed back into the water. Each student will catch their “shrimp” and record their data. When each student in the group completes the activity, there should be four sets of data points.
 - Optional (based on grade level): Each group will combine their data points and calculate the percentage of each item caught in their nets.

- The teacher will lead a discussion on which nets caught the most “shrimp” and the least “shrimp”. Students will analyze why certain nets caught more shrimp than others through an open forum/scientist circle.

3) The teacher will explain to the students that shrimping vessels and nets have adapted over time to meet the needs of the shrimpers. The lesson today will focus on the history of shrimping vessels and how they change over time. These changes have shaped the shrimp industry and the amount of shrimp that can be caught. Students will return to their seats and the teacher will play the History of Shrimp Fishery of the Southeastern US ([History of the Shrimp Fishery of the Southeastern US](#)) video for students (~4 minutes).

- Ask students to write down three things they noticed and one thing they wonder.

3) Replay the video and encourage students to pay attention to the changes that occurred to the boats and shrimp production. Teachers can stop the video after certain sections to ask students what they noticed in the video.

- What changes happened to the shrimping vessels over time, and how did these changes impact production?
- What were the ways that shrimp was packaged and distributed?
- How do you think these advances in shrimping have impacted the environment?

4) Think-Pair-Share: Think: The teachers show the images of the different shrimping vessels (Evolution of Shrimping Vessels provided) and ask students to notice differences between them. Students will be given 2 minutes to think about the differences. Share: Students will talk to their shoulder partner about what they observed. Partner A will share first while Partner B listens. Students will be given 1-2 minutes to share, and then the partners will swap roles. (Images below: Evolution of Shrimping Vessels)

5) Think-Write-Share: Students will look at the images of where brown and white shrimp are located (Shrimping Locations Handout provided). Prior to the round robin, students will study the maps and write down what they observe. Students will jot down the pros and cons of having different boats in these locations. (Which boats would serve each area and why? Why would a particular boat not work well in all areas?) The teachers should give students 3-5 minutes to jot down their thoughts. When the teacher calls “time”, students will share down one thing they wrote down. Students will have about five minutes to discuss what they noticed. Each student will continue to share one thing they wrote until the teacher calls “time”.

6) Discussion: The teacher will take about five minutes to discuss with students what they noticed about the different types of ships and where they would best catch their shrimp.

Explore (10-15 minutes)

1) Jigsaw: The teacher will inform students that today they will learn about the changes to shrimping vessels throughout time. Students will become an “expert” on the boat for their time period and teach the rest of the class about their shrimping craft. The teacher will divide the students into five groups. Each group will be given one shrimping vessel/time period (pre-1920s, the 1920s-1930s, 1940s to 1950s, 1960s to 1970s, and

1980s to 2020s handout provided). Each student in the group will become an “expert” of one component from the article (components are vessel description, construction material, engine, navigation equipment, voltage, length of trip, accommodations, and engine manufacturers). The teacher must note that some of these sections are smaller than others so students can do two or more components.

2) Students will take 10-15 minutes to read about their shrimping vessel component and write a well-crafted summary of the topic. These summaries should explain the feature and why each part is important.

Explain (20-25 minutes)

1) The group members will then take turns sharing their article pieces with the other members in their group.

2) Students will create a graphic organizer, Google Docs, or Google Slides showing who did which component and a brief summary of a few facts from each area. This item should be available to all group members (it will be needed in the next section of the lesson).

Expand (15-25 minutes)

1) Students will stand up from the seats and gather their notes on their shipping vessel. When the teacher says go, students will put their hands up in the air and find a partner (outside of their group) to partner with whom to share or discuss.

2) The students do a “high five” and put their hands down when partnered. The students take turns sharing about their shrimping vessel.

3) When the students have finished sharing, they place their hands back in the air and find an individual from a different group. Students cannot go back to their original group or a group that they have already paired with.

4) After students have learned about the other four shrimping vessels, the teacher will have the students freeze and return to their seats.

5) The teacher will have one “expert” from each group describe their shrimping vessel and give examples about how the vessels have changed over time.

6) The class then takes the information obtained from the think-pair-share and creates a timeline to visualize the evolution of shrimping vessels.

7) Revisit trawl (Reengineer)---Students will take the knowledge that they have learned throughout this lesson and reengineer their trawl. The teacher should have students think about what they could add (or remove) from their trawl to increase shrimp production? Reduce the number of unwanted creatures from being caught?

- After students have reengineered their trawls, they will repeat the shrimp catching lab from the Engage portion of the lesson. See below for instructions:

- Each student will close their eyes and will attempt to capture their “shrimp” in their net. Students only get two sweeps to collect their “shrimp”. After the second sweep, students will record the number of each item collected in their net. The items will then be placed back into the water. Each student will catch their “shrimp” and record their data. When each student in the group completes the activity, there should be four sets of data points. Data points should be collected in a chart in the student’s notebook or from the datasheet provided.
- Optional (based on grade level): Each group will combine their data points and calculate the percentage of each item caught in their nets.
- The teacher will lead a discussion on whether their improvements to their trawls increased their shrimp production.
 - Why did the trawl catch more (or less) shrimp?
 - What other improvements could be done to the trawl to increase the likelihood that only shrimp will be caught?
 - Do you think it’s possible to only catch shrimp in the nets?
- Students will analyze why certain nets caught more shrimp than others through an open forum/scientist circle.

7) Optional: Students will create a Venn diagram comparing two different shrimping vessels.

Evaluate (5-10 minutes)

Exit Ticket

- 1) Analyze how the changes to the shrimping vessels over time have impacted the shrimping industry? What about the environment?
- 2) What do you anticipate would be some benefits/consequences of these changes to how shrimp are caught?
- 3) How could shrimp vessels be further modified to improve production?

Optional: Have students create their own shrimping vessel based on the information they have learned. They can construct an older vessel or what they believe it will look like in the future. This can be done digitally or with physical materials.

References

ArcGIS. *Story map Journal*. arcgis.com. (n.d.).

<https://www.arcgis.com/apps/MapJournal/index.html?appid=2331b22022e14c70a31b7c2c2aadce>.

Tunnel, Jr., J. (2017). *Shellfish of the Gulf of Mexico*. doi: 10.1007/978-1-4939-3447-8_8.