

Louisiana Shells



Focus/Overview:

In this 3 part activity, students will learn about shells and mollusks, specific Louisiana mollusks, and classify different mollusk shells.

Learning Objectives:

The Students will:

- Understand what shells are made of
- Compare and Contrast Univalve to Bivalve shells
- Examine different types of Louisiana Shells
- Classify types of shells

Subject: Science

Grade Level: 3,4

Time: 2-3 class periods

Louisiana Science Grade Level Expectations

3 rd /4 th	Ask questions about objects and events in the environment (e.g., plants, rocks, storms) (SI-E-A1)
3 rd /4 th	Compare structures (parts of the body) in a variety of animals (e.g., fish, mammals, reptiles, amphibians, birds, insects) (LS-E-A3)
3 rd /4 th	Classify groups of organisms based on common characteristics (LS-E-A4)

Materials:

- Shells power point
- Copies of Shell Booklet (one for each student)
- Scissors
- Staplers (for binding)
- Optional binding: Hole punch, yarn
- Optional: colored pencils, crayons or markers

Vocabulary:

Shell- hard covering used by animals to protect them from predators and the environment

Invertebrate-an organism without a backbone

Exoskeleton- a hard covering on the outside of an animal's body that is used from protection and support

Mollusk-an invertebrate that has a soft, unsegmented body and live in or near the water. Most mollusks have an external calcium-based shell. Examples include snails, squids, and clams.

Part 1: An introduction to shells and mollusks

Background Information:

Shells are the hard, outer covering of animals. Many animals that have shells do not have internal skeletons (or backbones) and use shells for protection. Animals without skeletons (or backbones) are called **invertebrates**, and the shell of invertebrates is called an **exoskeleton**. Today we will be focusing on invertebrates called **mollusks** that live in a shell.

Mollusks generally live in or near water, such as marshes, lakes, rivers, and oceans. Their bodies are soft and muscle-like, with developed body organs including a nervous system, circulatory system, and respiratory system among others. Many mollusks protect their soft bodies with shell primary made up of calcium carbonate. Mollusks include snails, slugs, mussels, squids, octopus, and other strange organisms, but today we will focus on two types of mollusks with external shells, univalve (or gastropod) mollusks and bivalve mollusks.

Univalve mollusks also known as gastropods, only have one opening or piece to their shells. A mollusk with a univalve shell has usually a foot and head that live inside the shell, and can extend outside their shell to capture food, but retreat back inside the shell if a predator approaches. Univalves can live in the water or outside the water. Univalve mollusks include periwinkles, snails, abalone, and conch. Their shells come in many shapes, and can look like an nice cream cone, coiled like a spiral, or a small slipper.

Bivalve mollusks have two shells which are hinged together. They can be found in fresh or salt water. Bivalves pump water through their shells and filter out and eat tiny animals and plants in the water. Examples of bivalve mollusks include clams, mussels, oysters and scallops. Their shells are usually round or oval, but some can be shaped like a fan. Many of these bivalves are important food sources for people, both past and present, and have much cultural and economic significance. In addition, because they are filter feeders, many are sensitive to environmental change and pollution. Presence, decline, or absence of mollusks can serve as environmental indicators (indicator species).

More information on specific mollusks and their importance can be found in Part 2 of this lesson.

Advance Preparation:

1. Make copies of Shell booklet (one for each student)
 - a. You may make the booklets yourself, or have students make them in class.
2. Gather materials
3. Read Background Information

Procedure: Part 1

Engage

1. Pass out Shell booklet or booklet materials (one for each student).
2. Tell students that today they will be learning about shells. They will use this booklet to take notes as we explore shells.
3. If students are making the booklets, instruct students on how to put the booklets together:
 - a. Cut out each page along the dotted lines

- b. Put pages in numerical order.
- c. Staple the folded edge to bind, or hole punch and tie with yarn.
4. Remind students to put their names on the booklet and take notes during the presentation.
5. Show the students the interactive power point, Shells, SLIDES 1-7. VIEW POWER POINT IN PRESENTER MODE- NOTES AT BOTTOM OF SLIDES.

Explain/Explore:

6. Introduce vocabulary. Read background information to students about shells if needed.
7. Discuss questions from power point with students as they record their answers in the shell booklet.

Expand:

Guiding Questions to Students:

- Can you think of anything humans do or wear to protect themselves from their environment?
- Can you think of any animals that are similar to mollusks? Think of animals that come partway out of their shell to eat- what animals do this?
- Have you ever seen a mollusk? What did it look like? Feel like? Smell like

Blackline Masters:

- Shells power point-SLIDES: 1-7 (separate file)
- Shells Booklet- PAGES: 1-7

Part 2: Learning about Louisiana Shells

Background Information

Periwinkle Shells: Periwinkle snails are small univalve mollusks that can be found on marsh grasses, docks, and wooden pilings near the water. They secrete special mucus that cements them to structures. To move, they use rows of sharp, hooked teeth to eat away the hardened mucus and crawl around to eat algae off of nearby surfaces. They can replace up to 7 rows of teeth in one day. To protect themselves from predators and drying out, they use their tail to seal the shell. Periwinkles are a common food source for wetland animals like birds.

Mussels: Mussel is the common name used for members of several families bivalves found in fresh and saltwater. Freshwater mussels can be found in lakes, ponds, rivers, creeks, and canals. They have oval shells that may be light brown, purple or rose in color which make them popular for shell collectors. Mussels are tough creatures which close their shells to avoid short term exposure to toxins or other unfavorable environmental conditions. However, many populations of mussels in Louisiana, such as the Louisiana Pearlshell Mussel are threatened by human activities like logging and land development, which pollute waterways.

Oysters: Oysters are bivalve mollusks that have been eaten by humans, raw and cooked, for thousands of years. The Eastern American oyster (*Crassostrea virginica*) and the Pacific oyster (*Crassostrea gigas*), are harvested for food. Oyster shells are usually oval or pear-shaped, but will vary widely in form depending on what they attach to. They are generally whitish-gray in outer shell color, and their inside shell is usually a porcelain white. Oysters feed by filtering out algae and other food particles from the water they draw over their gills. Because of this, they are also extremely sensitive to water quality and susceptible to pollution. They can also retain toxins in their flesh, making them unhealthy for human consumption. Oyster shells have been used in coastal restoration, building barriers and stabilizing shore lines to reduce wave and storm impacts. Although it is possible for food oysters to produce pearls, they should not be confused with actual pearl oysters, which are from a different family of bivalves.

Rangia Clam: Rangia are bivalves mollusk which were an important food source for early primitive peoples along the coast, although the meat is not very nutritious. The clams were eaten so much by indigenous people that the discarded mounds of shells were created along the waterway, called “middens”. Some of these midden mounds can still be seen today throughout the Lake Pontchartrain Basin. From 1933-1990 Rangia Clams were harvested in Lake Pontchartrain. The shells were used for the construction of roadways, parking lots, levees and in the production of cement. Research using rangia clams for oil spill clean-up was also conducted following the BP Deepwater Horizon Oil Spill in 2010.

Procedure:

Engage

1. Show the students the interactive power point, Shells, SLIDES 8-11. VIEW POWER POINT IN PRESENTER MODE- NOTES AT BOTTOM OF SLIDES.

2. **OPTIONAL:** Use Jigsaw or similar method to teach about specific mollusks using the Louisiana Shell Cards Blackline Master instead of powerpoint, or in supplement.

Explain/Explore:

3. Read background information to students about shells if needed.
4. Discuss questions from power point with students as they record their answers in the shell booklet.
5. **Optional:** Pass out the Louisiana shell cards to each group. Use Jigsaw or similar student led method. Have the students use these to fill in their shell books about Louisiana shells.

Black line Masters:

- Shells power point-SLIDES: 8-12
- Shells Booklet- PAGES: 8-12
- Louisiana Shell cards

Part 3: Shell matching and comparisons

Advanced Preparation:

1. Make copies of Shell Matching Recording Sheet (one for each student)

Procedure:

Engage:

2. Pass out shell matching cards.
3. Have students work with the student that is sitting in front of them to match the picture with its description. Students can use their shell booklet from class to help them.
4. Students record their answers on their Shell matching sheet.
5. Go over their answers as a class to check their work.

Expand:

- Have students bring in shells they have collected. Try to group shells based on similar characteristics.
- Make a key based on the similarities found in shells
- Students can measure the length and width of different types of shells and graph results.
- Bring in Scope on a Rope from LSU and have students examine shells using a digital microscope.
- Invite local university Malacologists to come to speak with students about the study of shells.

Black line Masters:

- Shell Matching Recording Sheet

References:

Accessed 7/15/12 from: <http://animals.nationalgeographic.com/animals/invertebrates/oyster/>

Accessed 7/15/12 from: http://en.wikipedia.org/wiki/Common_periwinkle

Accessed 7/15/12 from: <http://en.wikipedia.org/wiki/Mussel>

<http://www.bio.umass.edu/biology/conn.river/fwmussel.html>

Accessed 7/14/12 from: <http://www.exploringnature.org/db/detail.php?dbID=43&detID=1142>

Accessed 9/1/15 from: <http://www.kidport.com/reflib/science/animals/mollusks.htm>

Accessed 7/15/12 from: http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/03/lowly_rangia_clam_as_oil-sucki.html

Accessed 9/1/15 from: <http://www.oceanicresearch.org/education/wonders/mollusk.html>

Accessed 9/1/15 from:

http://www.selu.edu/acad_research/programs/turtle_cove/assets/boardwalk_pdf_files/rangia_clam.pdf

What is your favorite type of mollusk? _____ Page 12

List two interesting facts about it:

1. _____

2. _____

Why is it your favorite?

Draw a picture of your favorite mollusk in the box below.



Fold

Shells



Name: _____

Mollusks

Draw a picture in the box below of a mollusks' environment.



Write one example of a mollusk:

Take a guess...

What do you think shells are made of? _____

Was your guess correct? Write what shells are made of:

Animals without bones are called:

Shells are also called:

What does the shell do for the animal? _____

Univalve Mollusks

Page 5

Draw a picture of a univalve mollusk in the box below.



How does a univalve mollusk eat its food? _____

Univalve Mollusks

Page 4

What do you think a univalve mollusk is? _____

List the different shapes that a univalve mollusk could be:

1. _____

2. _____

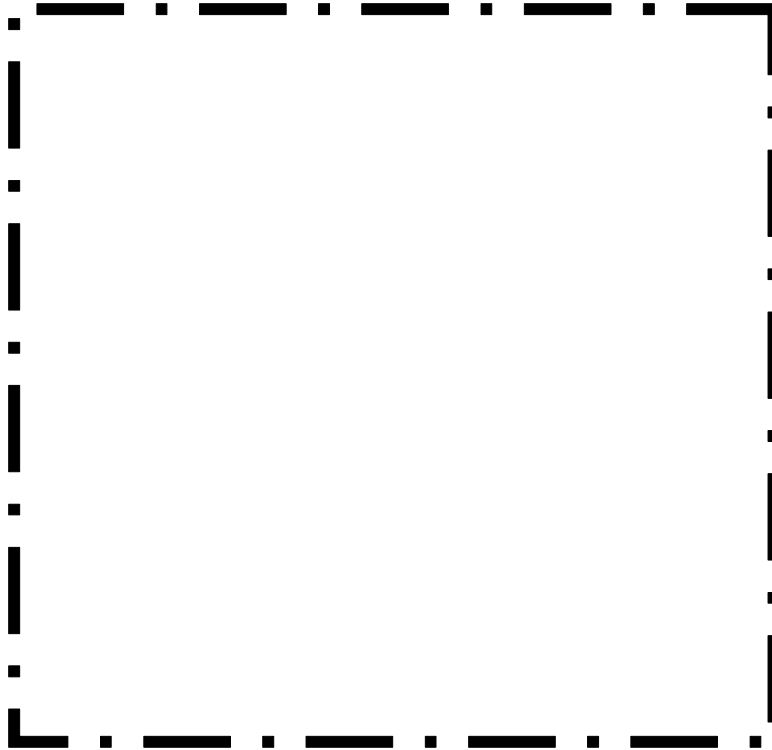
3. _____

An example of a univalve mollusk is: _____

Bivalve Mollusks

Page 7

Draw a picture of a bivalve mollusk in the box below.



Do bivalve mollusks eat food the same as univalve mollusks? How do they eat food? _____

Bivalve Mollusks

Page 6

Bivalve Mollusks have _____ shells.

Their shells are _____ together.

What are some shapes that a bivalve mollusk can have?

1. _____
2. _____
3. _____

An example of a bivalve mollusk is: _____

Mussels

Page 9

Circle your answer: mussels are **bivalve** or **univalve**?

List two places the mussel is found:

1. _____
2. _____

List two interesting facts about the mussel:

1. _____
2. _____

What two words describe the mussel?

1. _____
2. _____

Periwinkle Snail

Page 8

Circle your answer: periwinkle snails are **bivalve** or **univalve**?

List two places the periwinkle snail is found:

1. _____
2. _____

List two interesting facts about the periwinkle snail:

1. _____
2. _____

What two words describe the periwinkle snail?

1. _____
2. _____

Rangia Clam

Circle your answer: rangia clams are **bivalve** or **univalve**?

List two places the rangia clam is found:

1. _____
2. _____

What are two things the rangia clam is used for?

1. _____
2. _____

What two words describe the rangia clam?

1. _____
2. _____

Oysters

Circle your answer: oysters are **bivalve** or **univalve**?

List two places the oyster is found:

1. _____
2. _____

What are two things the oyster used for?

1. _____
2. _____

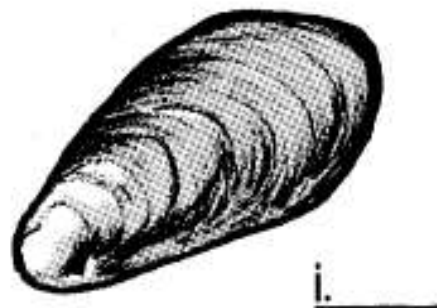
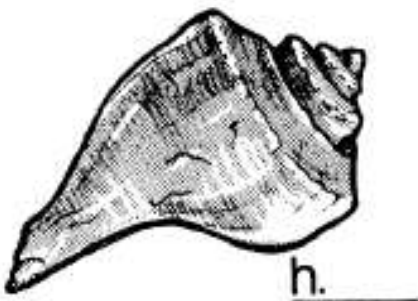
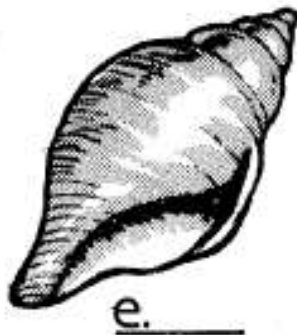
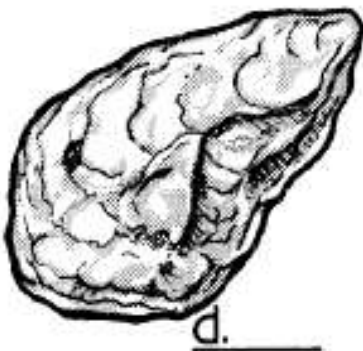
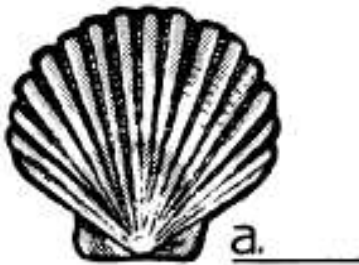
Have you ever eaten oysters before? If so what did they taste like? If not would you like to eat an oyster? _____

Name: _____

Shell Matching Recording Sheet

Directions: Use the shell cards to help you match the pictures of the shells with their descriptions. Work with your partner to solve. Be sure to record your answer

1. **Scallop:** ribbed, fan-shaped, "ears" at base.
2. **Oyster:** deeply ridged, rough to touch, gray-white in color, shaped like a lopsided saucer.
3. **Sea Mussel:** an irregular oval in shape, low horizontal ridges, smoother than the oyster.
4. **Cockle:** ribbed, fan-shaped, no "ears" at base.
5. **Clam:** rounded shape, low horizontal ridges, no "ears" at base.
6. **Periwinkle Snail:** small, cone-shaped, climbs marsh grass.
7. **Spiked Limpet:** flat, rough, star-shaped spikes radiating from center.
8. **Whelk:** rounded, like a rolled cone in shape, has a large cavity for animals.
9. **Tulip Shell:** smooth, rounded, like closed tulip petals in shape, circular lines.
10. **Murex:** somewhat like a whelk in basic shape, but having many spines and knobby protrusions that give it a distorted appearance.



Louisiana Shell Cards

Teacher Instructions: Cut our cards and make copies as needed.

Periwinkle Snail Shell

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