

Sea Week: Activities & Worksheets

Welcome! We hope the following hands-on activities & worksheets will serve as helpful supplemental materials to your Sea Week curriculum. Most of these art & observation activities focus on mollusks and can be done in the classroom. A few activities correspond with your beach field trip, such as the science notebook. Several of the activities require sea shells, so might best be done after your field trip. Below is a table of contents to help you quickly reference materials in this document. Remember, these are just suggestions and any activity can be modified to best correspond with your student's academic level 😊

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Enjoy the materials!

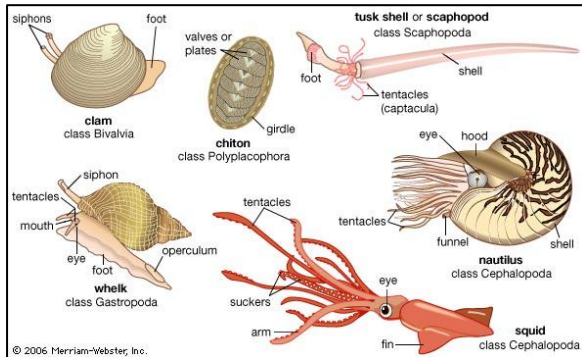
ACTIVITY 1

Shell Identification

Purpose: to introduce students to the phylum Mollusca.

Materials:

- A variety of shells
- 'Mollusk Anatomy' handout (pg. 6)
- 'Mollusk Illustrations' handout (pg. 7)
- White board



Process:

1. Pass around the shells and begin asking students what they know about the shells; what might have lived in the shells; etc.
2. Using the anatomy & illustration sheets, discuss the idea that some marine soft-bodied animals live inside very hard shells and travel about or dig with a large muscular foot. These animals come in a wide range of shapes & sizes, but all belong to the family of mollusks.
3. Note that some mollusks, such as octopuses, squids, & nudibranchs (sea slugs) can fool observers by not having a hard shell covering, but are also mollusks.
4. Ask students how the shells are similar and how they are different.
5. Write bivalve, univalve/gastropod, chiton, and Cephalopoda on the board and group the pictures and shells by these categories. Use the mollusk worksheets, photographs, & examples, to introduce students to mollusk classes.

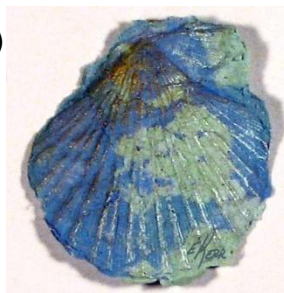
ACTIVITY 2

Making Stuffed Bivalves

Purpose: to familiarize students with bivalve identification through art!

Materials:

- Newsprint, construction or butcher paper
- Staples
- Scissors
- Cardboard
- Popsicle sticks (could add to the scallop patterns)
- Newspapers
- String
- Wire
- Art supplies
- Bivalve patterns (pgs. 8-9)



Process:

1. Make cardboard patterns for the different bivalves, such as scallops, clams, cockles, & mussels.
2. Have students trace two copies of one pattern of their choice.
3. Once the pattern is cut out, staple the pattern around the outside or punch holes around the outside and lace the halves together. Leave an open space so you can fill the pattern with stuffing.
4. Paint, color or design outside of the shells.
5. Crumple newspaper or paper scraps to stuff inside the shells. Once stuffed, staple shut the opening.
6. Label the shells by name. You can hang them around class OR gather several together and create a mobile.



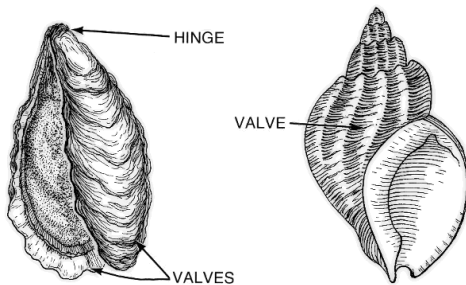
use a piece of driftwood you find on your field trip & use that as the top of your mobile; attach stuffed bivalves w/ wire.

Shell Comparison

Purpose: to familiarize students with the similarities & differences between the Bivalve & Gastropod (aka univalve) classes.

Materials:

- Sample gastropod shells (snail, limpet, whelk)
- Sample bivalve shells (mussels, clams, scallops)
- 'Mollusk Anatomy' handout (pg. 6)
- 'Mollusk Illustrations' handout (pg. 7)



Process:

1. Explain that “valve” is another word for shell. Ask what students think the “bi” and “uni” means.
2. Hand out the shells & ask students:
 - What is similar about these shells?
 - What is different about these shells?
 - Why do you think the shell’s inside is smooth? (to prevent injury to the soft-bodied animal inside)
 - Why do you think the shells are rougher on the outside? (to provide protection from elements, weathering)
3. Using the illustrations handout, point out & label important shell parts. Explain that, internally, the univalve has many of the same structures found in a bivalve, but in the gastropod, those organs are most often twisted into the spiral shell.



Students can each pick a shell & record observations in their science notebook. After picking a volunteer to share their findings, the class could guess which shell that student had observed.

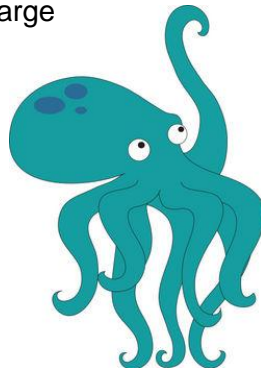
ACTIVITY 4

Cephalopod “Squirt”

Purpose: to demonstrate how an octopus uses ink against predators as a form of defense.

Materials:

- Water table or small tub
- Water balloon
- Food coloring
- Plastic toy shark (or other large predator)
- Safety pin



Process:

1. Fill a water balloon with water & place seven or eight drops of dark food coloring into the balloon before tying it close.
2. Fill the water table or small tub with water & place toy predator in the water.
3. Place the water balloon in the tub (this represents the octopus which is the prey).
4. Show students that the shark can see the octopus.
5. Remove the water balloon and carefully put a tiny hole (end of a safety pin is good) near the knot & place back in the water.
6. Students will see how the ink helps hide the octopus (prey) from the shark (predator) & distract it. This is so the octopus can escape.

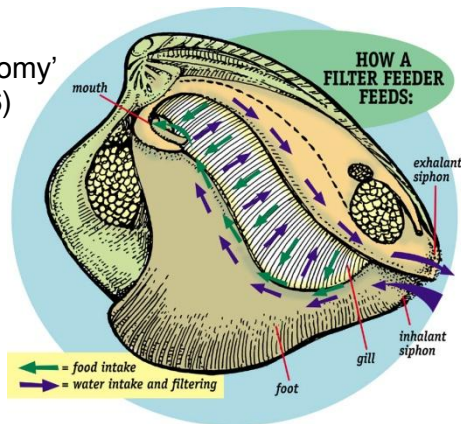
ACTIVITY 5

Filter Feeder Demonstration

Purpose: to demonstrate how some mollusks, such as bivalves, filter their food.

Materials:

- Sand
- Water
- Tray or tub
- Coffee filter
- 'Mollusk Anatomy' handout (pg.6)



Process:

1. Show the anatomy illustration of a bivalve and explain: These animals, mainly clams, depend on sucking in large amounts of seawater and filtering out the organisms or debris material for their food. Clams use their tube-like siphon to suck in water which is filtered by hair-like cilia. Collected food is passed into the stomach and seawater or waste is expelled back out the siphon. Let's see how it's done...
2. Mix some sand with water (sand represents food bits).
3. Hold the coffee filter over the tray or tub.
4. Pour the sand water through the filter to demonstrate the clam's feeding process.

ACTIVITY 6

Shell Flowers

Purpose: a fun art & identification activity using collected sea shells!

Materials:

- Step-by-step process (pgs. 11-12)
- Various kinds of shells
- Green vinyl-coated wire (thick & thin gauge)
- Foam buttons or balls (for flower centers)
- Hot glue gun w/ glue drip pad
- Glue sticks
- Assorted pliers
- Tempera paint (assorted colors)
- Paint brushes
- Styrofoam trays for paints & brushes
- Beach rocks
- Paper towels

Process:

Step by Step instructions (pgs. 11-12)



Mother's Day is right around the corner & these make great gifts!

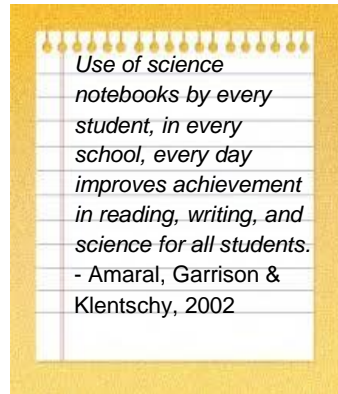
ACTIVITY 7

Science Notebook

Purpose: for students to create their own unique notebook, compiling their Sea Week activities & handouts. This could also serve as an observation journal during their beach field trip.

Materials:

- Notebook paper, worksheets, hand-outs, etc.
- Hole punch
- String or twine
- Driftwood or stick
- Shells
- Paints, crayons, or markers
- Glue



Process:

1. During your beach field trip, have students collect a small piece of driftwood.
2. Hole punch all Sea Week hand-outs, worksheets, observations, etc. They should be arranged in a portrait layout.
3. Place the driftwood or stick above the papers, lying horizontally.
4. Thread string through the holes and tie around the driftwood.
5. Students can create a decorative cover page.



Once your class is done using the shells from previous activities, students can glue them onto their notebook.

ACTIVITY 8

Field Trip Wrap-up

Purpose: to discuss observations & share science notebook activities from your field trip to the beach.

Materials:

- Science notebooks
- Activities from notebook (pgs. 10-11)
- White board

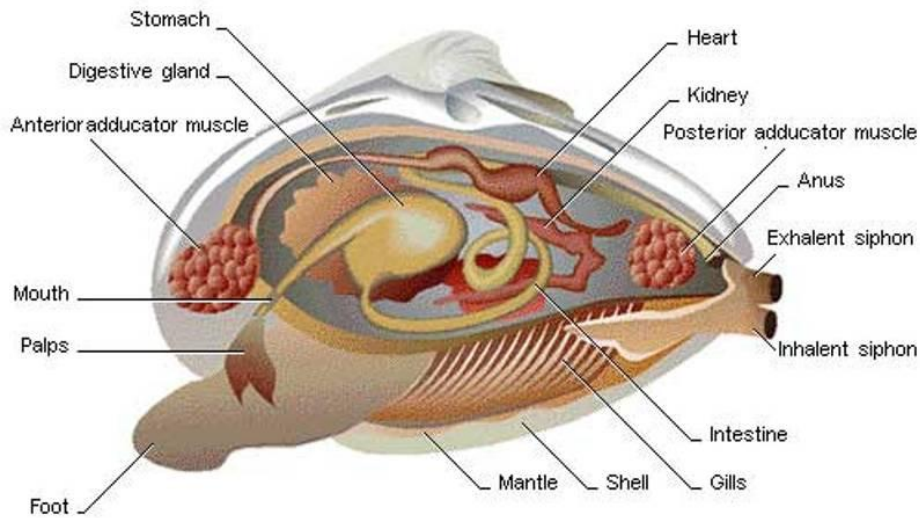
Process:

1. Lead a wrap-up discussion after your beach field trip.
2. Have students share their science notebook discoveries & questions.

MOLLUSK ANATOMY

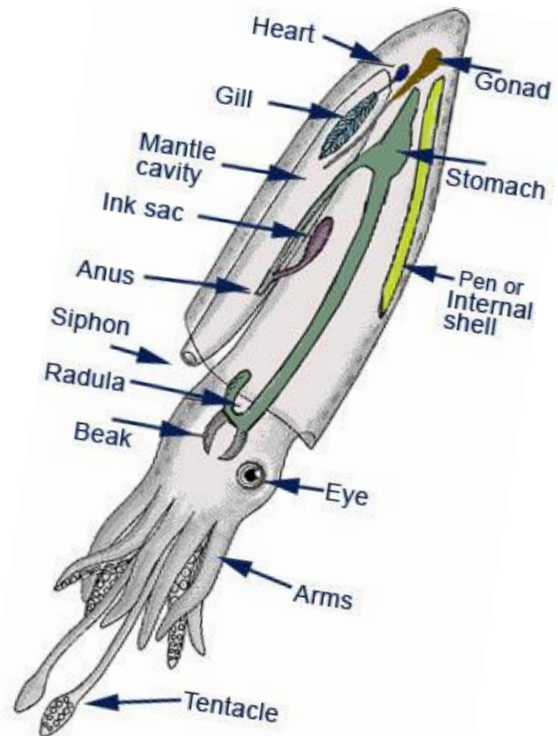
(activity 1, 3)

6



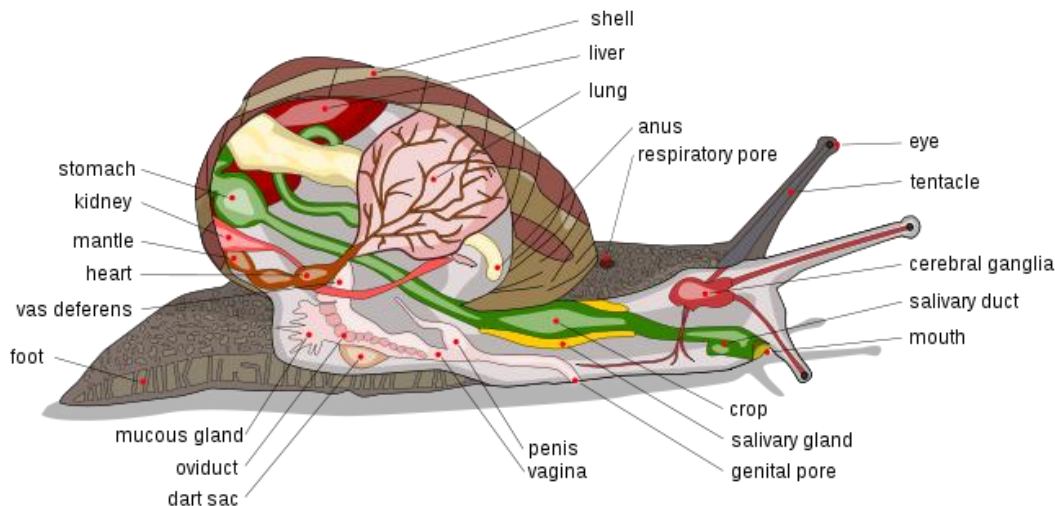
Left: Anatomy of a bivalve

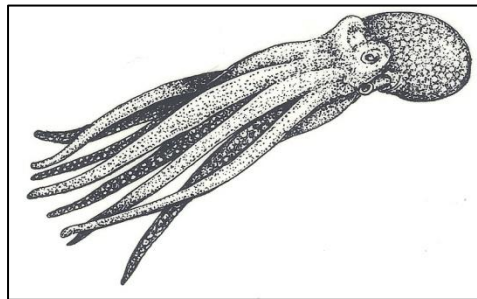
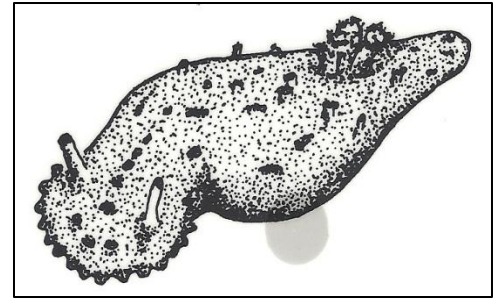
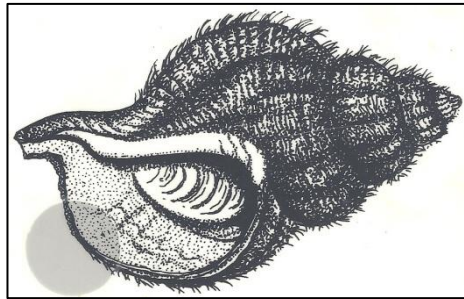
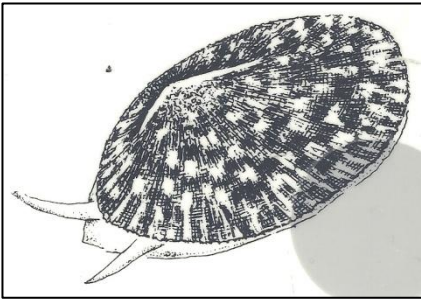
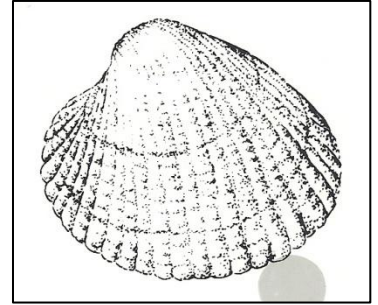
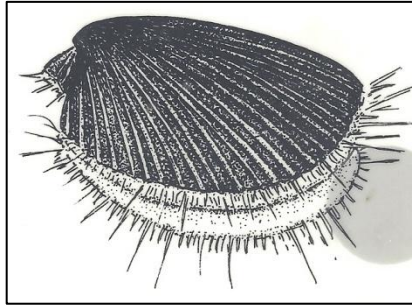
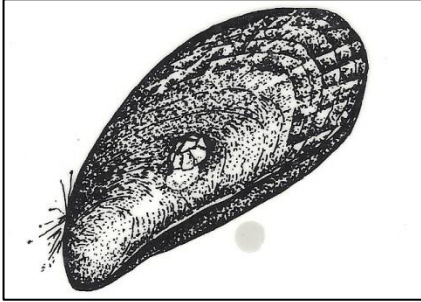
Right: Anatomy of a cephalopod



Below: Anatomy of a Gastropod (aka univalve)

Note: gastropods contain eyes & tentacles which are not present in the anatomy of a bivalve.





CEPHALOPODS

**GASTROPODS aka
UNIVALVES**

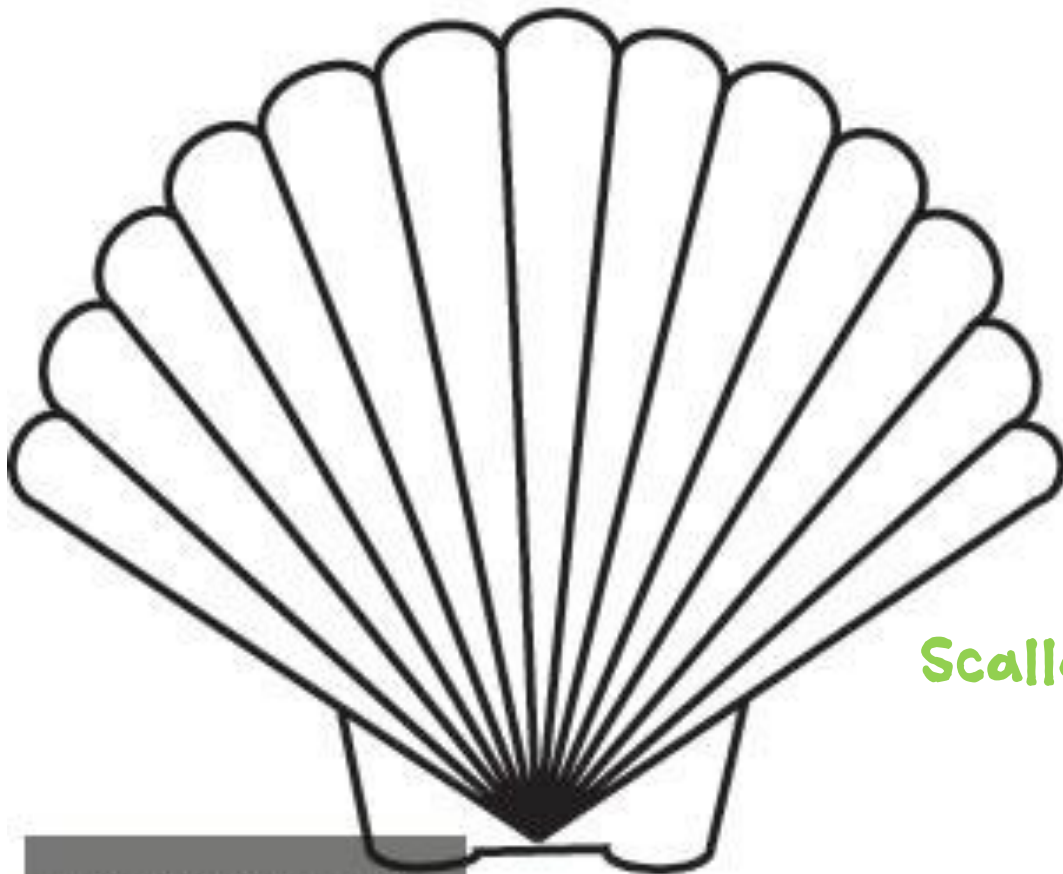
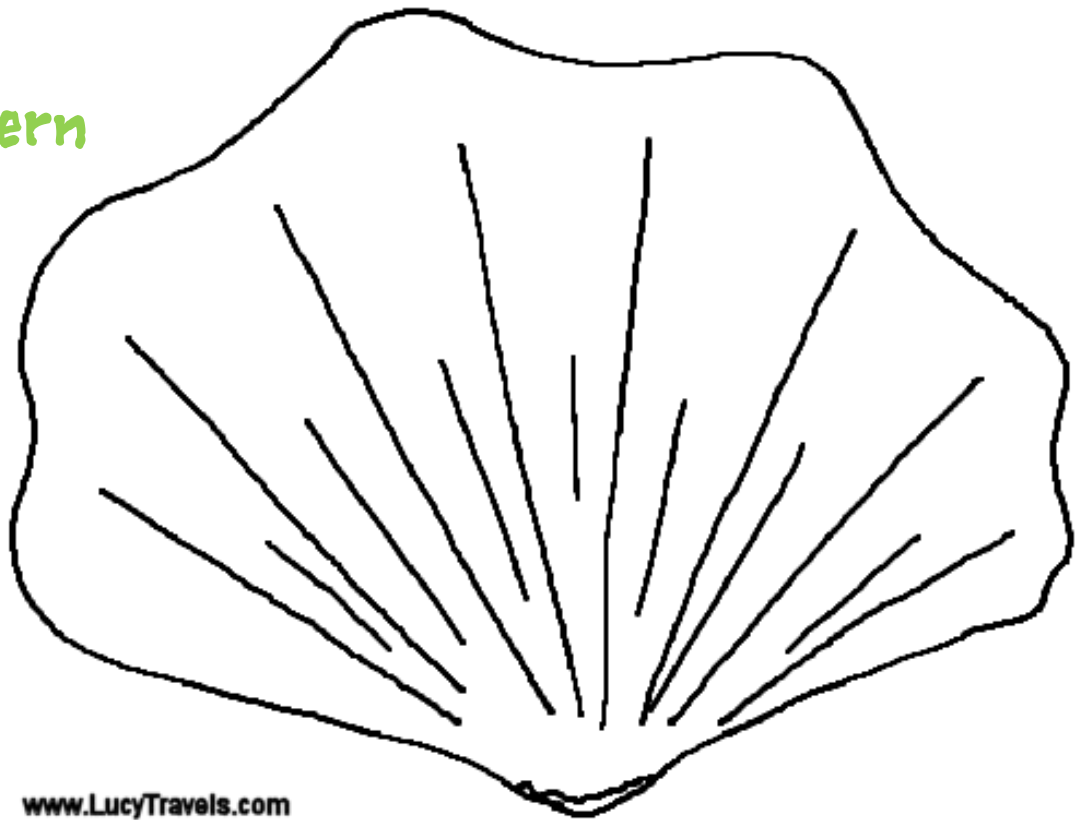
BIVALVES

Labels for
matching

Bivalve Patterns (activity 2)

8

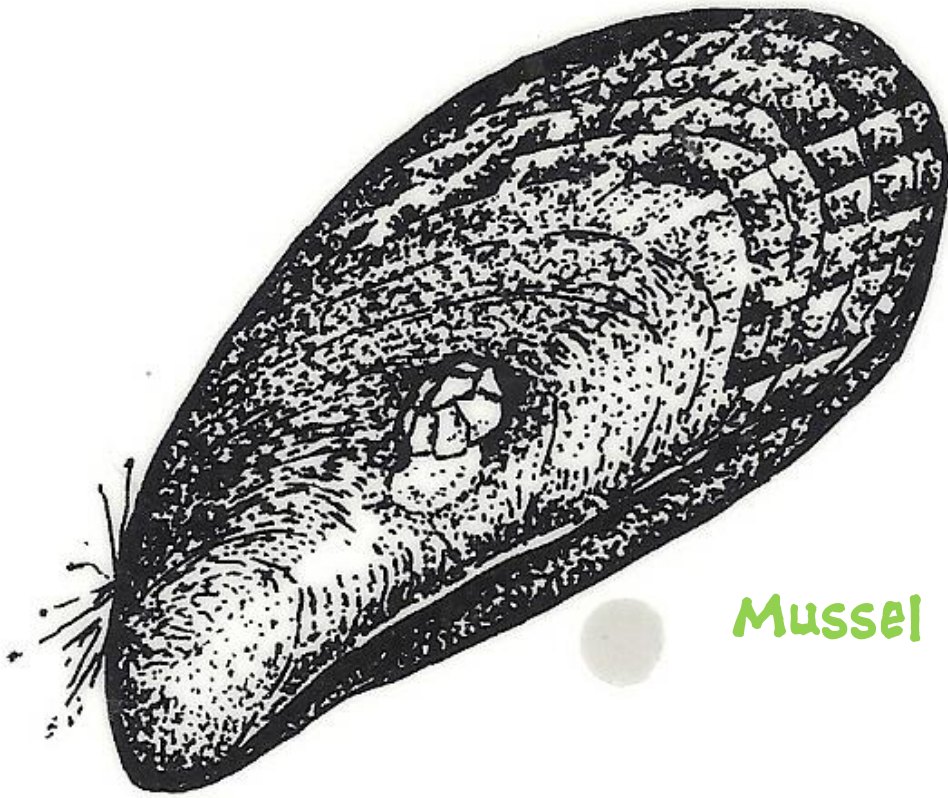
Cockle Pattern



Scallop Pattern

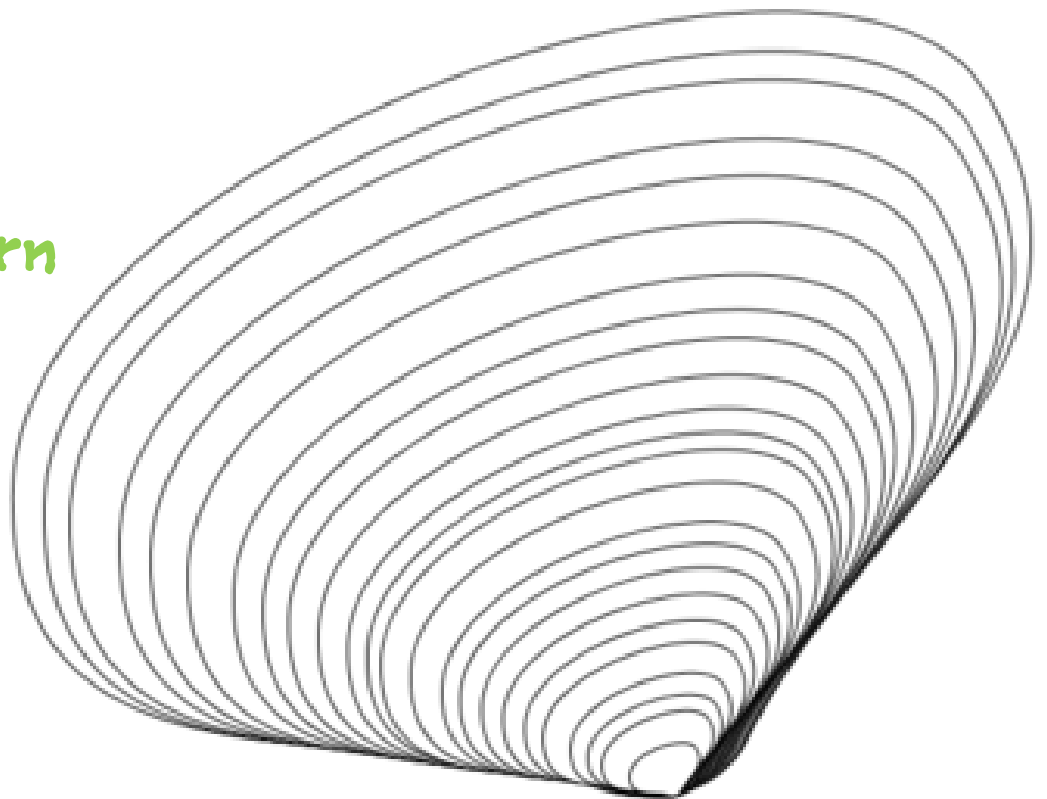
Bivalve Patterns (activity 2)

9



Mussel Pattern

Clam Pattern



Beach Field Trip: Sample Observation Worksheet

10

Name: _____

1. My animal is a _____

2. This is a large picture of my animal. I have been very careful to show all its special parts:

3. I used a magnifying glass to observe the special parts of my animal: eyes, foot, tentacles, siphons, etc. Here are three up-close drawings:

4. Here is a question I have about my animal...

Beach Field Trip: Critter Investigation

11

Below are several observation activities that might be fun & educational on your visit to the beach.

In this tide pool I found a critter. Guess what it is by checking each feature. (good partner activity)



How many feet? _____ arms? _____
Does it have a shell? _____ how many? _____
What's its shape? _____
How does it feel? _____
What does it look like? _____
It must be a _____
Now that we know, I'm letting it go!

Habitats: Plants & animals on a rocky shore choose homes high up, midway or low down in the intertidal zone, based on how much splashing & air exposure they can handle. You might find certain critters higher up or lower down on the beach.



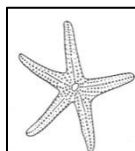
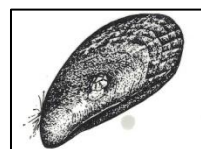
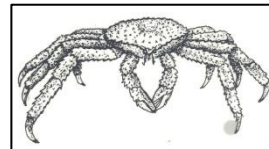
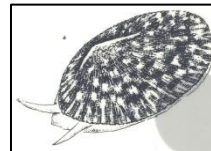
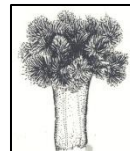
As you walk down the beach, are you finding different animals? _____
What animals do you see higher up on the beach? _____
Lower? _____

Matching Game: Draw a line from the animals to where they are found on the beach.

HIGHER

MIDDLE

LOWER



How-to: Shell Flowers

12

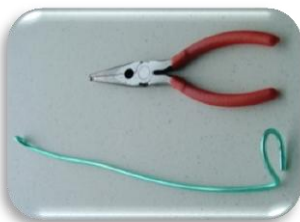
Set-Up

This activity can be a bit messy, as is any project involving glue & paint, so you will want trays & paper towels on hand and a covering for your surface area. To start, pass around the shell & rock buckets. Students should pick 3-6 shells & two rocks for their shell flower. A volunteer or parent should be available to help with the hot glue gun. The sequence outlined below is the suggested order, but doesn't need to be followed to a T.

Process

1. Make your stem:

- Pre-cut enough stems for each student using thick or thin gauge wire. Make them between 10" – 12." Colored vinyl coated wire may be found in hardware stores, often labeled for clothesline use.
- Using the pliers, bend a large circle on one end, approx. 2 fingers width.
- Bend a smaller circle on the other end, about 1" in width.



2. Glue the stem:

- Place the larger circle end to the bottom of the rock and glue into place (make sure stem is bent so it sticks straight up out of rock).
- Let this set for 5-10 minutes.



Materials you'll need:

- 1 bucket of sea shells (various kinds – mussels, clams, scallops)
- 1 roll green vinyl-coated wire (thick & thin gauge cut into 1' pieces)
- 1 pkg foam buttons or balls (for flower centers)
- 1 hot glue gun w/glue drip pad
- 1 pkg glue sticks – dual temp
- 1 needle nose & lineman pliers
- 3-6 bottles tempera paint (assorted colors)
- 1 roll of paper towels
- 6-12 paint brushes
- 3 styrofoam trays for paints, brushes, buttons
- 1 bucket beach rocks

3. Arrange your shells:

- Once students have their shells arranged, place the small circle end of the stem in the center.
- Now you are ready to glue. Add a generous amount of glue on the tips of each shell and in the center, securing the stem to the shells.
- Let this set for 5-10 minutes.



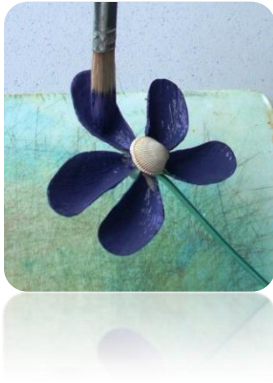
4. Add the center:

- Pick out a center for the flower, whether it be a smaller shell, a button or foam ball.
- Add a generous amount of glue and add the center piece.
- Let this set for 3-4 minutes.



5. Get creative:

- Time to beautify your flower with paints, glitter, or even the addition of leaves.
- For the leaves, cut a small piece of wire and twist it around the stem or glue another shell(s) on and let set 8-10 minutes being careful not to disturb while the glue hardens.



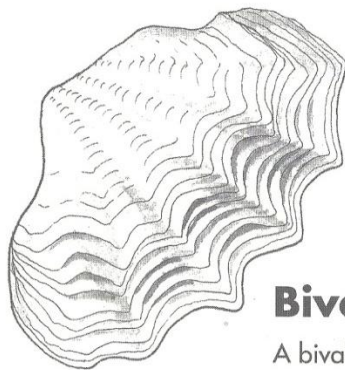
6. Final touches:

- Before or after painting, glue the second rock to the other side of the stem so flower is being held up between the two rocks.
- Use a generous amount of glue and let set for 5-6 minutes.

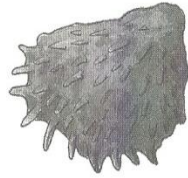


Bivalve Classification & Activities

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Fluted Clam
Tridacna squamosa
Indian, Pacific



Spiny Oyster
Saccostrea kegaki
Pacific

Northern Dwarf-tellin
Tellina agilis
Atlantic



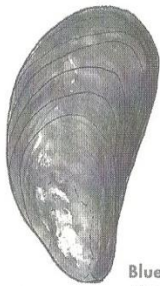
Soft-shelled Clam
Mya truncata
Arctic, Atlantic, Pacific



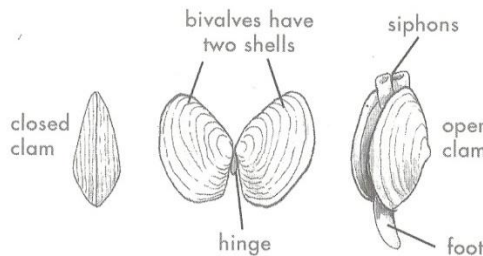
Pen Shell
Pinna muricata
Indian, Pacific

Bivalves

A bivalve (BY-valv) is a filter feeder—it eats tiny food bits found in seawater. Many clams filter feed using siphons. Seawater goes in one siphon and out the other. As the seawater passes through the clam, bits of food are filtered out. Find the siphons on this page and color them blue.



Blue Mussel
Mytilus edulis
Arctic, Atlantic, Pacific

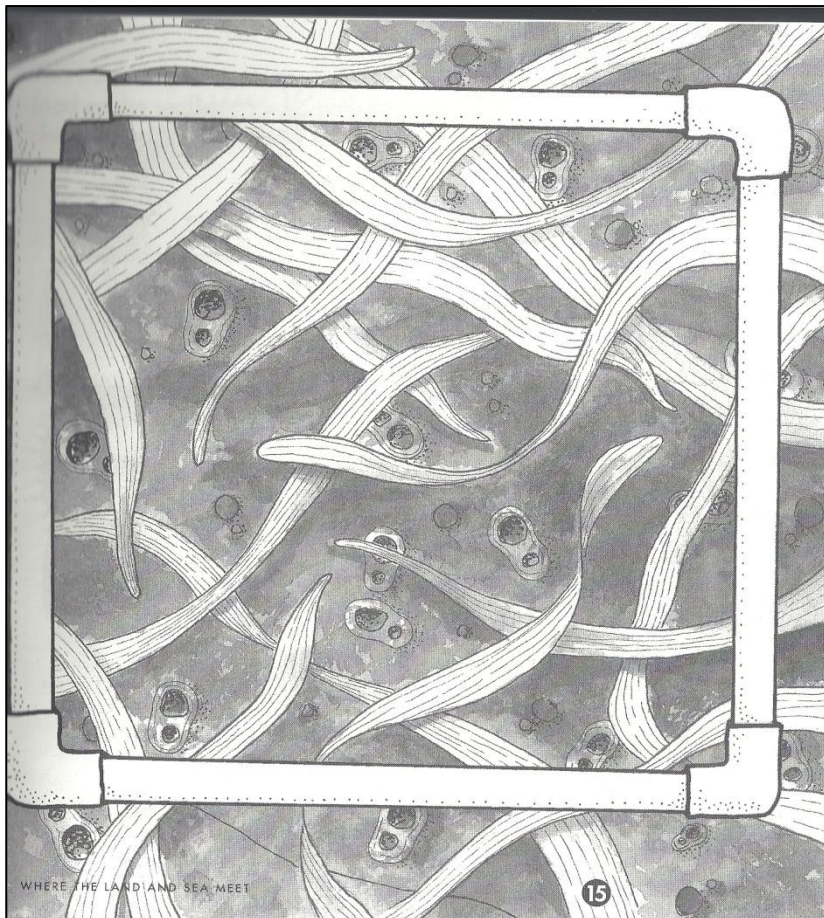


Calico Scallop
Argopecten ventricosus
Pacific

WHERE THE LAND AND SEA MEET

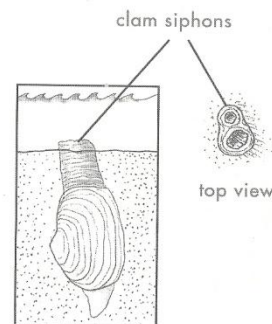
14

A NaGISA ACTIVITY BOOK



The scientists would like to know how many clams are in this quadrat. Find the clam siphons that are *completely* inside the frame and circle them in orange.

How many clam siphons are in the quadrat?



Side view, most of clam is hidden under the seafloor

WHERE THE LAND AND SEA MEET

15

A NaGISA ACTIVITY BOOK

South Polar Limpet
Nacella concinna
Southern

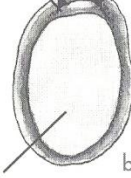


top view



head

Lesson's False Limpet
Siphonaria lessoni
Atlantic



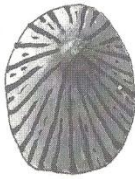
bottom view

foot

Ribbed Limpet
Lottia digitalis
Pacific



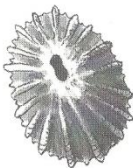
Black-lined Limpet
Cellina nigrolineata
Pacific



Common Limpet
Patella vulgata
Atlantic, Mediterranean

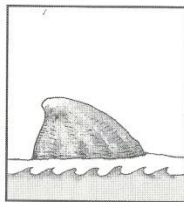


Japanese False Limpet
Siphonaria japonica
Pacific

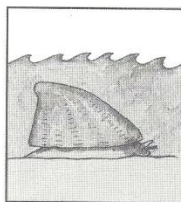


Knobbed Keyhole Limpet
Fissurella nodosa
Caribbean

side view,
low tide



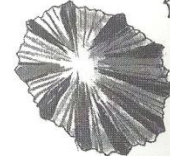
side view,
high tide



How many
limpet shells
are on this page?

.....

China Limpet
Patella ulyssiponensis
Atlantic, Mediterranean

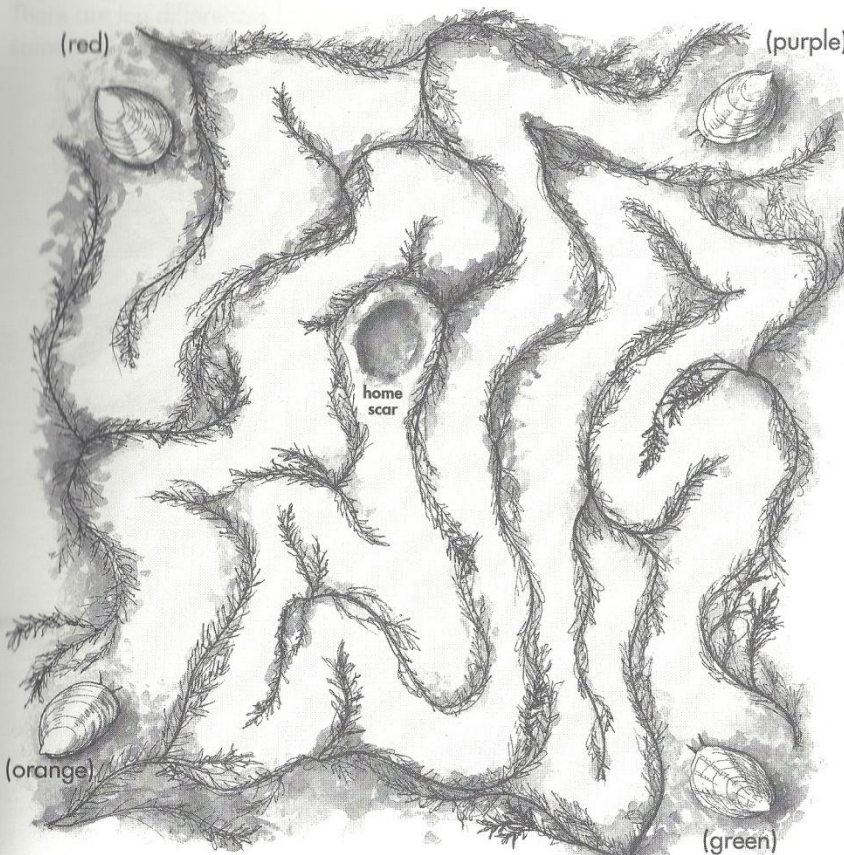


False Limpet
Siphonaria tenuicostulata
Indian



(red)

(purple)



Limpets graze on algae.
During low tide, many limpets
return to the same spot, called
a home scar.

Color each limpet as shown.
Then, find which limpet gets
through the maze and back to
its home scar.