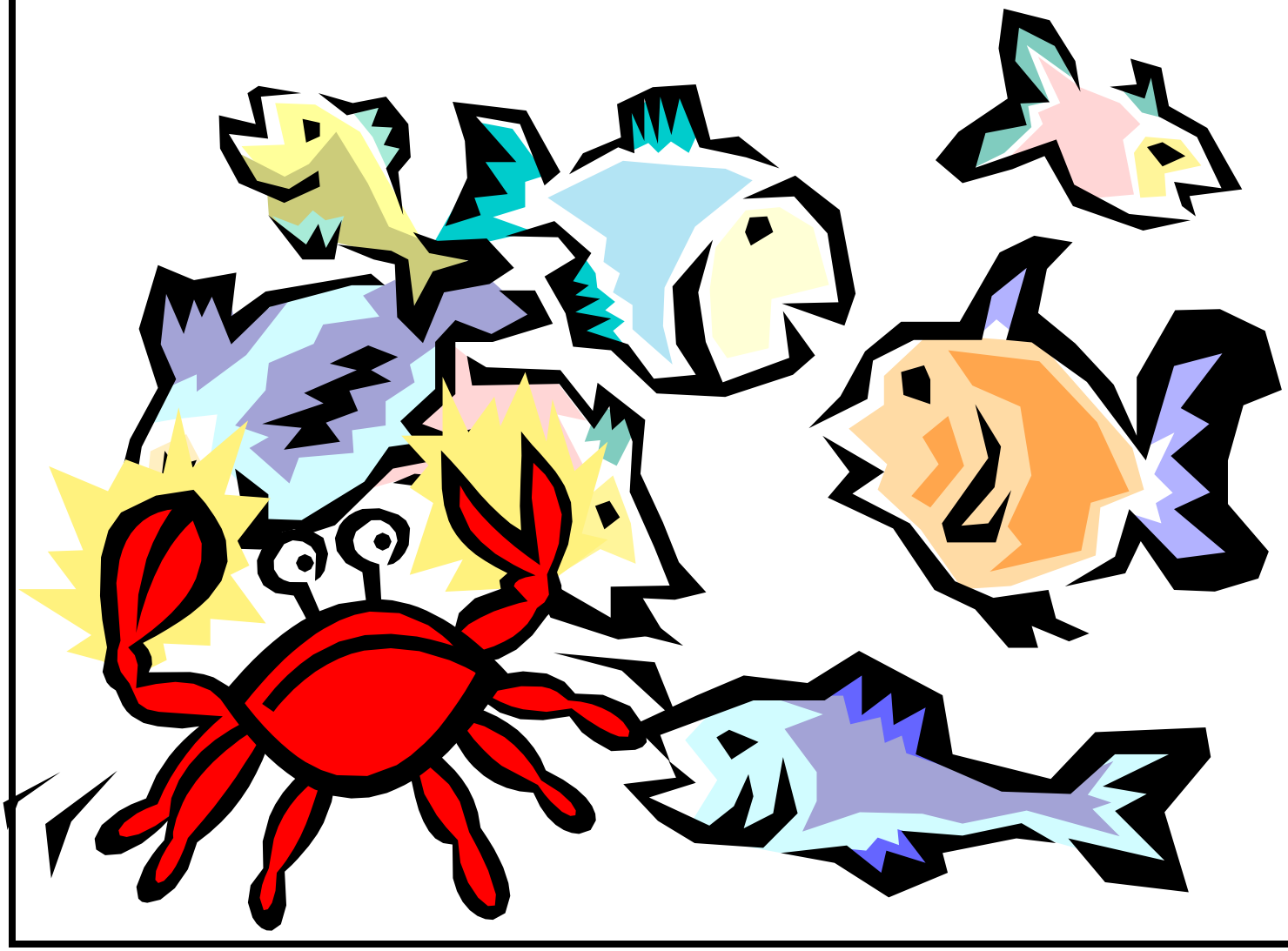
KINDERKRITTERS

ASSATEAGUE ISLAND NATIONAL SEASHORE

Kindergarten School Visits
Pre and Post Visit Activities



INTRODUCTION

Thank you for selecting Assateague Island as a school visit location. What better way for students to learn about their environment than by experiencing a living classroom? You can make this visit an even more memorable one by creating a sense of anticipation. Try some of the pre and post visit activities in this packet to spark your students imaginations in preparation for their field trip.

Students arriving with prior knowledge of the resource will be better prepared to explore and retain what they learn during the program. Post visit activities can help students evaluate the experience and incorporate new information and ideas into relevant classroom discussion.

Please hold on to this set of materials so it can be used again next year.

Staff at Assateague Island National Seashore hope your school visit will be productive. Please fill out the attached evaluation. We are interested in your comments.

"Sandcerely"

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Maryland Voluntary State Curriculum

KinderKritters
Kindergarten
Assateague Island National Seashore Program

Science Content Standards

1. Skills and Processes – Students will demonstrate the thinking and acting inherent in the practice of science.
A. Scientific Inquiry. 1. Seek information through observation, exploration and descriptive investigations.
B. Critical Thinking. 1. Identify similarities and differences among objects and materials.
C. Applications of Science. 2. Use scientific knowledge to solve everyday, science-related problems.
D. Technology. 1. Identify models of real objects and compare the models to the real objects.
E. History of Science. 1. Describe how everyone can do science and invent things.

2. Earth/Space Science – Students will use scientific skills and processes to explain the chemical and physical interactions (i.e., natural forces and cycles, transfer of energy) of the environment, Earth, and the universe that occur over time.
*A. Materials and Processes That Shape A Planet**.** 1. Describe and classify Earth materials based on their physical properties.*
*E. Interactions of Hydrosphere and Atmosphere**.***

3. Life Science – The students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.
A. Cellular. 1. Identify and describe living and non-living things.
B. Genetics. 1. Identify and describe a variety of animals and their offspring.
D. Biochemistry. 1. Observe and describe characteristics, basic needs, and life cycles of living things.

4. Chemistry – Students will use scientific skills and processes to explain the composition, structure, and interactions of matter in order to support the predictability of structure and energy transformations.
A. Properties of Matter. 1. Identify, describe and compare properties of objects..

5. Physics – Students will use scientific skills and processes to explain the interactions of matter and energy and the energy transformations that occur.
A. Mechanics. 1. Identify and describe the different ways objects move.
B. Thermodynamics. 1. Describe the way the sun warms the land, air, and water using observations and age appropriate tools.

6. Environmental Science – Students will use scientific skills and processes to explain the interactions of environmental factors (living and non-living) and analyze their impact from a local to a global perspective.
B. Interdependence of Organisms. 1. Observe and recognize that animals depend on plants for food and shelter.
D. Environmental Issues. 1. Recognize that learning about the environment is an important human activity.

(Selected standards may vary and will be represented in pre/post visit materials and education programming)

VIRGINIA STANDARDS OF LEARNING

Programs presented in the Chincoteague National Wildlife Refuge

Assateague Island National Seashore Virginia District

Kindergarten

Indicators (Programs will vary. Selected indicators will be represented in pre/post visit materials and education programming.)

The kindergarten standards stress the use of basic science skills to explore common materials, objects, and living things. Emphasis is placed on using the senses to gather information. Students are expected to develop skills in posing simple questions, measuring, sorting, classifying, and communicating information about the natural world. The science skills are an important focus as students learn about life processes and properties of familiar materials such as magnets and water. Through phenomena including shadows, patterns of weather, and plant growth, students are introduced to the concept of change. The significance of natural resources and conservation is introduced in the kindergarten standards.

- K.1 The student will conduct investigations in which basic properties of objects are identified by direct observation
- K.2 The student will investigate and understand that humans have senses including sight, smell, hearing, touch, and taste.
- K.4 The student will investigate and understand that objects can be described in terms of their physical properties.
- K.6 The student will investigate and understand basic needs and life processes of plants and animals.
- K.8 The student will investigate and understand simple patterns in his/her daily life.
- K.10 The student will investigate and understand that materials can be reused, recycled, and conserved.

TEACHER'S VOCABULARY SHEET

Please choose selected words to go over with your class in advance of the field trip.

beach – the area where the ocean meets the land; Assateague's beach is made of sand.

camouflage – animals that blend in with their surroundings; animals use their color, patterns and shapes to accomplish camouflage.

carnivores – a meat eater.

cartilage - "rubbery" bones; sharks, rays and skates are cartilaginous fish.

clam – an animal with two rounded shells and filters plankton for food; a bivalve that lives below the surface of the bottom, clams use siphons for filter feeding, clams are able to move with their muscular foot.

dune – a large mound of sand formed around plants; sand moved by wind and waves collects around vegetation to form mounds known as dunes, dunes move and change with the wind and waves.

endangered – only a few animals or plants of a certain kind are left alive; a plant or animal in danger of becoming extinct.

extinct -- certain kind of animal or plant is completely gone from the earth.

flounder – flat fish with excellent camouflage for survival; flounders have both eyes on one side of their body, the eyeless side faces down and is usually white.

food chain -- sunlight helps plants grow, plants are eaten by animals, animals are eaten by other animals; a passage of energy, where plants or producers are food for animals (consumers).

fresh water -- drinking water, rain water; water that does not contain dissolved salts.

habitat -- an animal's natural home; must provide food, water, shelter and space.

horseshoe crab – A crab that's not really a crab! Horseshoe crabs are more closely related to spiders, ticks and scorpions than true crabs; horseshoe crabs are harmless, ancient creatures surviving and living on earth since before the dinosaurs.

island - land surrounded on all sides by water.

mussels – an animal with two thin, narrow shells and filters plankton for food; mussels attach in one place with special threads called byssal, blue mussels and ribbed mussles are common at Assateague.

piping plover – a small endangered shorebird that nests on wild, natural beaches; piping plovers are small sandy-colored shorebirds, coastal development has destroyed most of the piping plover's habitat.

plankton -- microscopic plants and animals living in salt water and fresh water.

salt water - ocean water; contains dissolved salts.

sand – rocks and shells broken down into tiny pieces; Millions of years of rain and climatic changes break down mountains. Very small pieces of rock are carried down from mountain tops by streams and rivers and deposited along the coastline. This sand now forms barrier islands with beautiful beaches.

school - many of the same kind and same size of fish swimming together; fish swim in schools for protection from predators.

sea star – (once called star fish) star-shaped animals with arms connected in the center of the body; sea stars have a mouth in the center of their arms on the bottom side of their body, sea stars move with rows of tiny tube feet, sea stars are predators.

shell – the skeleton of a snail, clam or mussel; the exoskeleton made by a univalve or bivalve.

skate – a flat harmless fish with "rubbery" bones; skates are cartilaginous fish related to rays and sharks.

skate egg case – nicknamed "mermaid's purse"; a black casing that protects a baby skate during its development before it is born.

skeleton – bones or shells that support and protect an animal's body; skeletons provide attachment for muscles.

snail – large and small animals with one shell on their back; most snails have a large muscular foot for movement, a radula for feeding, tentacles, eyes, and an operculum to seal the opening in their shell.

telson – a horseshoe crab's tail; the last abdominal segment in a crustacean or horseshoe crab.

tides - the periodic rise and fall of the sea level along the coasts resulting from gravitational forces of the moon and the sun on the earth

waves -- wind moving over the surface of the water creates wave action.

whelks – beautiful large sea snails found in the ocean near Assateague Island; Channeled whelks have smooth spiraled shells, Knobbed whelks have knobby spiral shells.

wind - the movement of air between two different places.

ASSATEAGUE ISLAND BEACH BINGO

Generalization: The place where land and water meet is a dynamic zone full of hidden treasures.

Objectives: Students will be able to identify some of the animals associated with the beach/ocean habitat.

Preparation: Make enough copies of the bingo sheet and the graphics sheet for each student. Cut out each of the large bingo graphics in advance to use during the game as you would bingo numbers. It might be a good idea to laminate these separate images so they can be used again in the future. Collect a few prizes should you choose to present awards to winners.

Materials: Bingo sheets, scissors, bingo chips or markers, awards, colored pencils or crayons, paste/glue.

Procedure:
Have a little fun with Assateague animals while preparing students for their visit to the island. Assateague Island Bingo is designed to introduce students to vocabulary associated with the ocean/beach environment.

The game may be played in a variety of ways depending on age and ability.

<u>Simplest</u>

1. Select 9 images from the graphics sheet and have students cut them out and color them.
2. Distribute bingo sheets and chips or use colored pencils.
3. Identify each of these creatures and show the class the associated image.
4. Have students paste or glue a picture into the bingo sheet boxes. Students may choose any empty block they wish so that each bingo sheet is different.

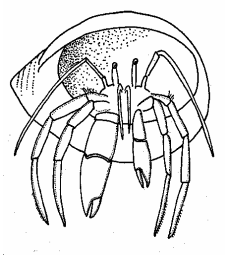
5. Make sure the students understand that every block should be filled with a graphic. When the students are ready, tell them that you will be calling out an animal name and showing them the image to go along with it. Students should match the creature you show them to one on their sheet and place a chip or **X** over the creature.
6. When a student has 3 across, down or diagonally, he/she calls out "Assateague!"
7. Students must review their 3 graphics. If all three match the images you called out, the student wins!
8. Teachers! Remember to keep track of each image and identification called out!

<u>More challenging</u>

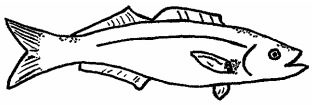
Use all the graphic images and then follow the above instructions.

<u>Most challenging</u>

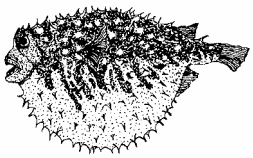
Do not show the graphics, but rather call out the identifying name of each creature so that students must match the graphics they have pasted onto the bingo sheets.



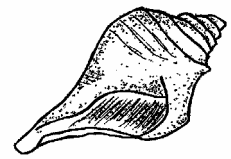
Ark



Bluefish

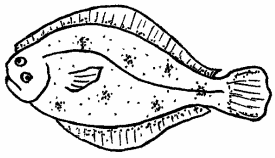


Burrfish

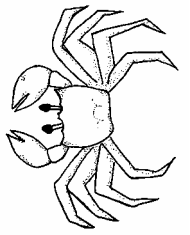


Channel Whelk

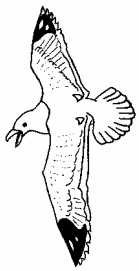
Coquina clams



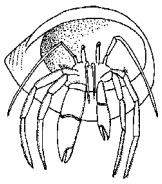
Flounder



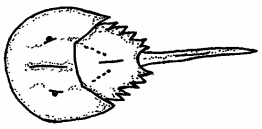
Ghost crab



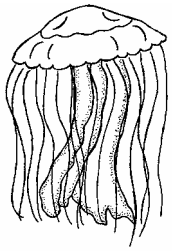
Gull



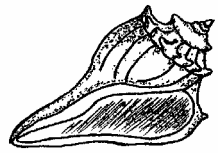
Hermit crab



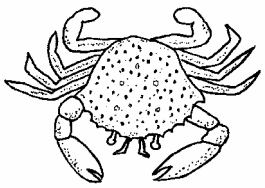
Horseshoe crab



Jelly

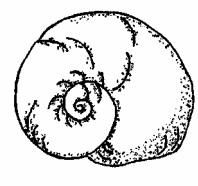


Knobbed whelk



Lady or calico crab

Mole crab

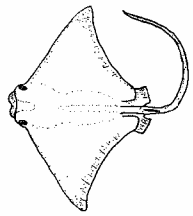


Moon snail

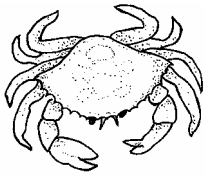
Brown pelican

Piping plover

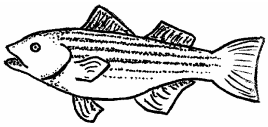
National Park Ranger



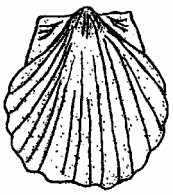
Ray



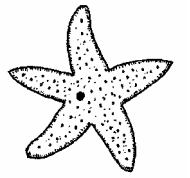
Rock crab



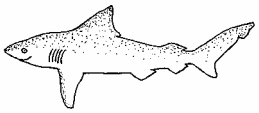
Rockfish



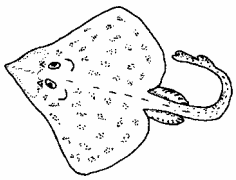
Scallop



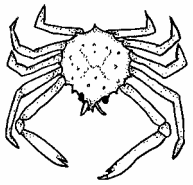
Seastar



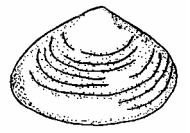
Shark



Skate

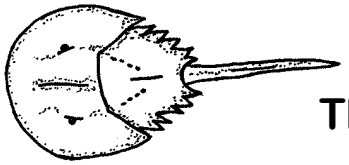


Spider crab



Surf clam

Tern



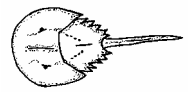
The Horseshoe Crab

Fact Sheet

- **<u>Horseshoe Crabs are completely harmless creatures!</u>**
- **The Horseshoe Crab is more closely related to ticks, spiders and scorpions than other crabs.**
- **The Horseshoe Crab has been living in the ocean for at least 250 million years…well before dinosaurs roamed the earth! It is sometimes called a "living fossil" since the species has not changed in appearance over millions of years.**
- **The Horseshoe Crab can be found from the coast of Maine to the Yucatan Peninsula.**
- **The Horseshoe Crab can grow up to 36 inches in length including the tail.**
- **Horseshoe Crabs can live for at least 15 years.**
- **Female Horseshoe Crabs grow larger than the males and can weigh up to 10 pounds.**
- **Horseshoe Crabs are classified as invertebrates (they have no backbone).**
- **Horseshoe Crabs have an exoskeleton (external skeleton), which they must shed in order to grow larger.**
- **Their bodies are divided into three parts; a helmet-shaped front shell, a hinged middle section, and a long spike tail.**
- **The tail, or telson, is not a defense mechanism. It is used to turn themselves right side up when they are upside down.**
- **Horseshoe Crabs have many eyes. They have two large compound eyes on either side of the outer helmet which can magnify sunlight 10 times! Two simple eyes at the front of their helmet sense ultra violet rays from the moon. They also have 5 eye spots and light sensors on their tail!**
- **Horseshoe Crabs have 5 pairs of legs. The first four pairs of legs are for walking and each is out fitted with a claw at the tip. The fifth pair of legs are used for propulsion along the bottom and acts kind of like a ski pole. Each leg is joined at the opening to the mouth with bristly grinders. These bristles act as teeth and crush food as it moves into the mouth. This "chewing" action is only possible when the legs are moving. So the Horseshoe Crab has to move or wiggle its legs to eat!**
- **What do they eat? Mostly sea worms and clams, but they can go for up to a year with out eating anything at all. Horseshoe crabs serve as a primary food source for the juvenile loggerhead turtle.**
- **Male Horseshoe Crabs have "boxing glove" shaped claws on their first pair of legs. These specialized clasper claws are used for attachment at the back portion of the female Horseshoe Crab's shell during spawning.**

- **During high tide nights in May or June, the female will drag the attached male (or males, sometimes 3, 4, or 5!) up on ocean or bayside beaches. Here she will lay many clutches of eggs in the sand.**
- **Female Horseshoe Crabs can carry up to 88,000 eggs (each clutch can hold up to 4,000). After the eggs are laid, the female will then drag the male over them for fertilization.**
- **Many migratory shorebirds depend on this spectacular Horseshoe Crab spawning event for nourishment on their annual journey north to breeding grounds as far north as the arctic circle.**
- **In about two weeks, at high tide, baby horseshoe crabs will hatch from their eggs. These larval Horseshoe Crabs bear a striking resemblance to their parents, they are a much tinier, tailless, version.**
- **Once harvested by the ton in the 1900's to be dried and used for fertilizer, the Horseshoe Crab is now used by man for much more important reasons. It's copper based blood turns blue when exposed to oxygen. Medical researchers have discovered a component of this blue blood is capable of detecting poisons in human blood. The Horseshoe Crab's blood has become a precious resource in checking purity of medications intended for human use. Blood is drawn from the Horseshoe Crab and the crab is released unharmed!**
- **Chitin from the shell of the Horseshoe crab is used to help skin grafts of burn patients heal faster.**
- **The Horseshoe Crab can survive doses of radiation that would kill a human.**
- **The Horseshoe Crab can endure extremes in temperature and salinity.**
- **Researchers believe a cure for cancer may lie buried in the secrets of this fascinating animal.**

HOORAY FOR HORSESHOE CRABS!!!!!



Generalization: The horseshoe crab is a living prehistoric relic. It is one of the most misunderstood creatures in the ocean!

Objectives:
1. Students will become familiar with the fascinating and harmless horseshoe crab.
2. Students will be able to identify horseshoe crab's relatives and habits.
3. Students will be able to explain the valuable role the horseshoe crab plays in the web of life.

Preparation: Review the horseshoe crab fact sheet. Make copies of the horseshoe crab patterns in advance. Construction paper will run through the copy machine one sheet at a time. This may help speed up the pattern making process. Make copies of the Horseshoe Crab Warm Up and review the warm up answer sheet.

Materials: Horseshoe crab fact sheet and warm up activity, horseshoe crab pattern, brown construction paper, scissors, crayons, markers, blue paint, glue or stapler

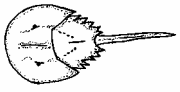
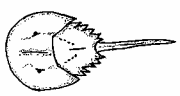
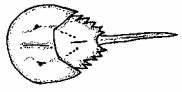
Procedure:
Do the Horseshoe Crab Warm Up as an anticipation exercise. Follow the instructions provided on the sheet.

Give each student a brown construction paper copy of the horseshoe crab pattern. Ask the students find the large head section of the horseshoe crab. Have students cut out the head section. Remind them to cut the small dotted line sections. At this point, review:

- *What is the function of the Horseshoe crab's shell?* It is for protection. It is the horseshoe crab's external skeleton.
- *How many eyes does the Horseshoe crab have?* The horseshoe crab has 2 large compound eyes on each side of the head, 2 small simple eyes on the front of the shell and 5 simple eyes under the front edge of the shell and at least one light sensor on the telson (tail). The horseshoe crab is able to see fairly well, sense light and darkness, and detect the phases of the moon. It cannot see colors, however.

Have students find the middle section of the horseshoe crab and cut it out. Review:

- *What is the function of this middle section of the horseshoe crab?* This section protects the horseshoe crab's respiratory organ, the book gills.
- *What is the function of the spines on this middle section?* The spines are movable and protect the horseshoe crab's gills. The gills are the only soft areas of the horseshoe crab's body. Predators like sea gulls or raccoons often feed on the gill area.

Have students find the tail section of the horseshoe crab and cut it out. Review:

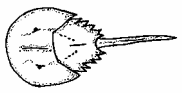
- *What is the function of the horseshoe crab's tail or telson?* The horseshoe crab uses its tail as a mechanism for turning over if it finds itself on its back. The tail is also used as a bit of a rudder when the horseshoe crab is crawling or swimming. The tail is not a stinger, nor is it used as a weapon.
- *Why is it important not to pick a horseshoe crab up by the tail?* The tail may break off. A very small muscle attaches the tail to the middle section. It would be like picking a person up by the ear!
- *What happens to a horseshoe crab if its tail is broken off?* If the tail is broken off a horseshoe crab, infection may set in and weaken or kill the animal. If the horseshoe crab found itself on its back, it would be unable to turn over, thus becoming vulnerable to desiccation (if out of water) and predators.

Have students find the leg parts of the horseshoe crab and cut them out. Review:

- *Can the horseshoe crab pinch you?* The horseshoe crab has very weak claws. The claws are designed for grasping soft marine animals such as worms and soft-shelled clams. If the horseshoe crab had sharp scissor-like claws, it would cut its food in half before it got to its mouth. The claws will hold on to your finger with a good grip but no pain!
- *How many legs does a horseshoe crab have?* The horseshoe crab has 5 pairs of legs. The first 4 pairs are for walking and feeding. The last pair act as ski poles and push the crab along the bottom.
- *Are there any differences between the male and female horseshoe crab's claws?* Yes! The first pair of claws on the horseshoe crab may tell you if it is a male or a female. A female has the typical scissor shaped claws. A male has "boxing glove" or "thumb's up" shaped claws designed for clasping onto the back portion of the female's shell during spawning. Young horseshoe crabs all have scissor shaped claws!
- *Can the horseshoe crab hurt you?* NO WAY! Horseshoe crabs do not bite, sting or pinch! Their mouth is located in the center of all the legs. The entrance to the mouth is bristly like a toothbrush. The horseshoe crab must wiggle its legs or walk in order to "chew" its food. The horseshoe crab looks scary, but its equipment poses no harm to humans, only worms and other soft creatures!

To assemble the horseshoe crab: *The teacher may choose to staple or tape the student's horseshoe crabs to save time, as gluing or pasting will have to allow drying time.

- Start with the head section. Attach the areas marked "a." Tuck outside "a" over inside "a" to achieve a 3-dimensional front shell.
- Next, attach the middle section to the head at "b." Put middle section "b" under head section "b" and attach.
- Attach the tail to the middle section at "c". Attach tail "c" under middle section "c."
- Last, attach the legs to the underside of the head section. The longest pair of legs is last and should be facing the tail.



Some other details to keep in mind:

- Horseshoe crabs often pick up “hitchhikers”! Barnacles, slipper shells, tubeworms and bryozoans may attach and find a home on the crab’s shell. These creatures do not harm the horseshoe crab. Horseshoe crabs must shed their shells many times in their life in order to grow larger. A new “clean” shell is free of “hitchhikers”, scratches and dings! An older shell will usually have scratches, dings and maybe a few “hitchhikers”. Students may want to decorate their horseshoe crabs with a few “hitchhikers”!
- Horseshoe crabs have copper based blood which turns blue when exposed to oxygen. This is unlike iron based human blood that turns red in the presence of oxygen. Horseshoe crab blood has been extremely valuable in medical research. Blood is extracted from the horseshoe crab without harm, and the crab is released. The blood is used in the study of diseases like Spinal Meningitis and cancer. A component of the horseshoe crab’s blood has proven to be invaluable in testing drugs before they are given to humans. The component, lysate, will clot in the presence of toxins thus indicating the drug is unsafe for humans.

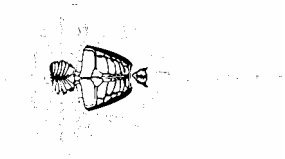
You might wish to repeat the warm up activity at this point.

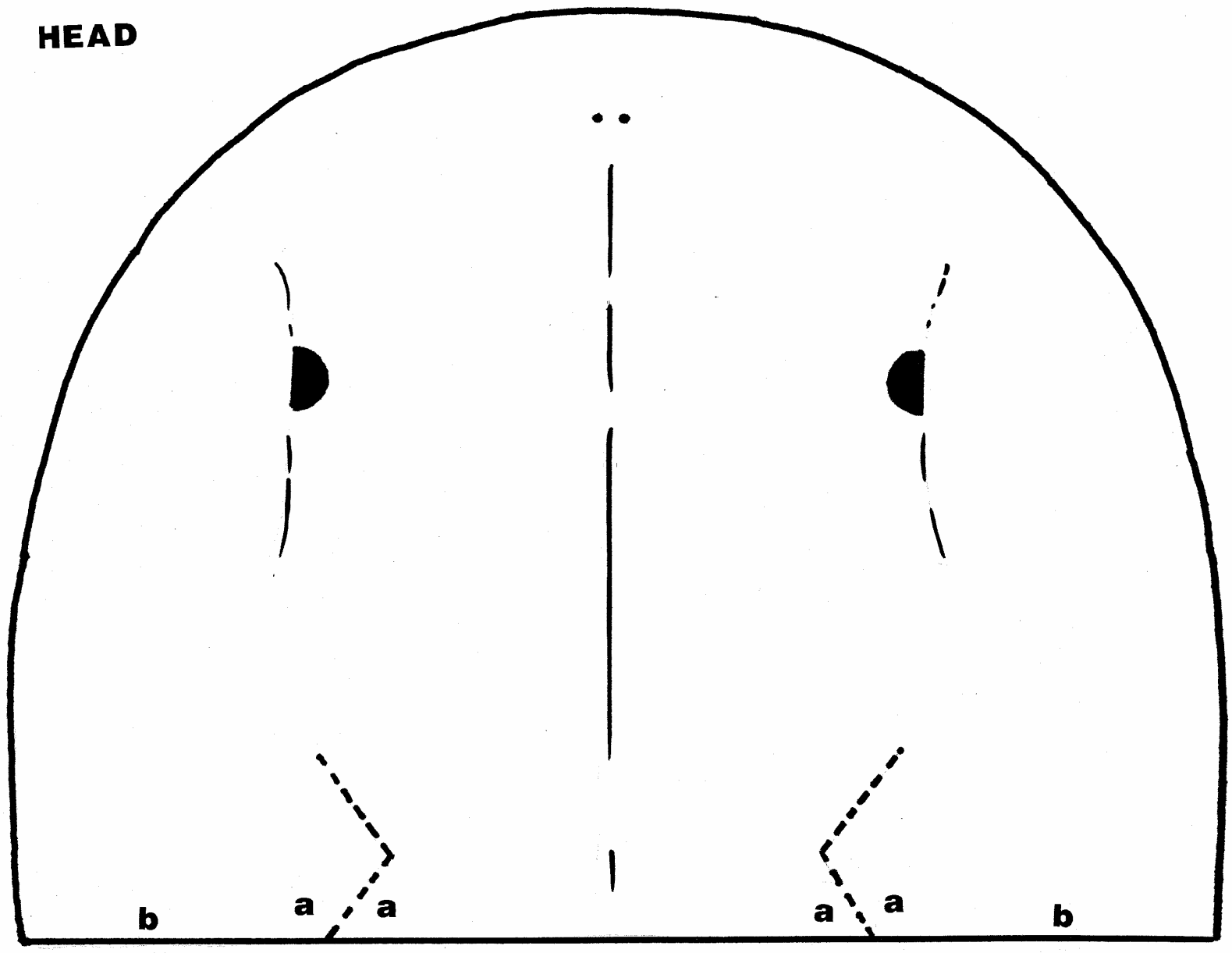
Horseshoe crabs are harmless, fascinating creatures. This one-of-a-kind creature deserves our attention. Horseshoe crabs migrate to the Delaware Bay region to spawn. Hundreds of thousands of horseshoe crabs crawl on the beaches to lay their eggs. Thousands of migrating shorebirds heading to breeding areas near the arctic circle depend on the horseshoe crab eggs for nourishment on this long journey. Horseshoe crabs are gathered from the beaches during this time by the thousands and loaded into trucks. They are being harvested by the boatload everyday, all for use as bait in eel and whelk pots. These practices have had a profound effect on the population of Horseshoe crabs in recent years. Their decline has in turn, caused a drastic decline in migrating shorebird species.

It is important for everyone to know that “scary, creepy-looking” creatures are not bad creatures. There is no “good” or “bad” in nature. Some creatures are dangerous and some are not. The horseshoe crab has survived over hundreds of millions of years, enduring drastic changes in global climates and ocean salinity, all to be possibly lost forever by the actions of people.

Extensions:

Visit the Delaware beaches during May and June to witness the horseshoe crab spawn. Contact Prime Hook National Wildlife Refuge, Delaware State Park System, or Delaware Department of Natural Resources for more information on spawning beaches to visit.

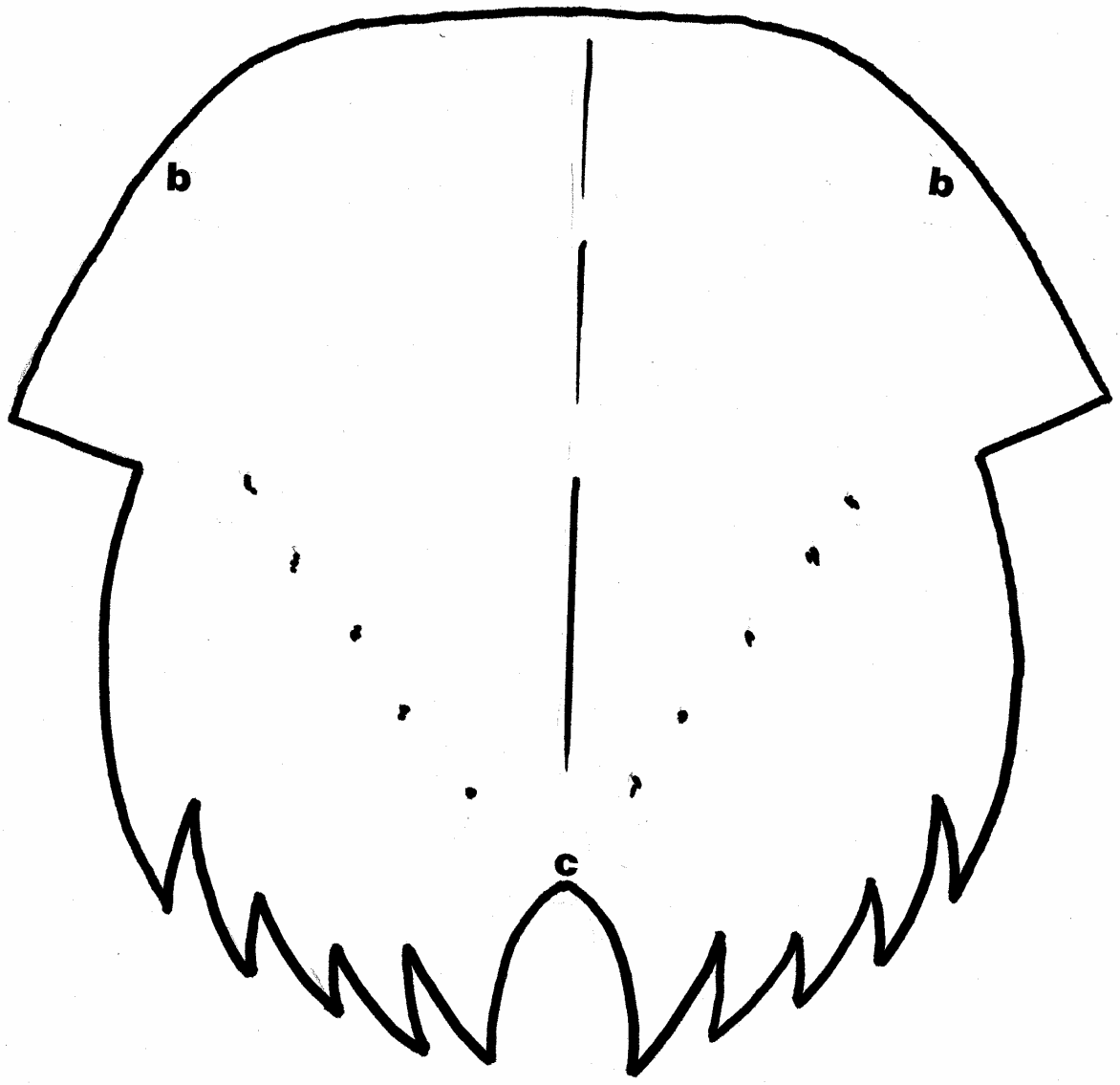




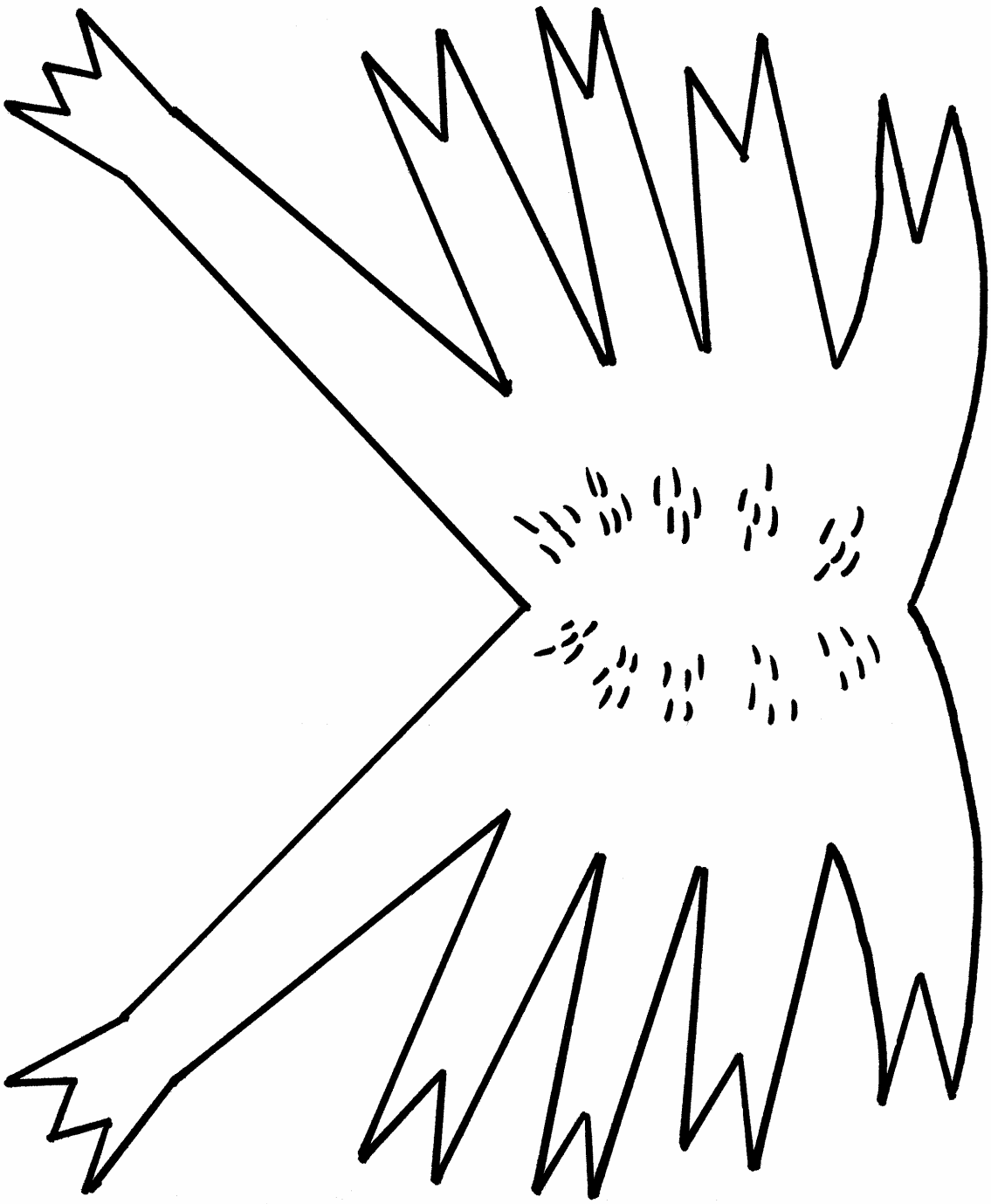
cut along dotted lines

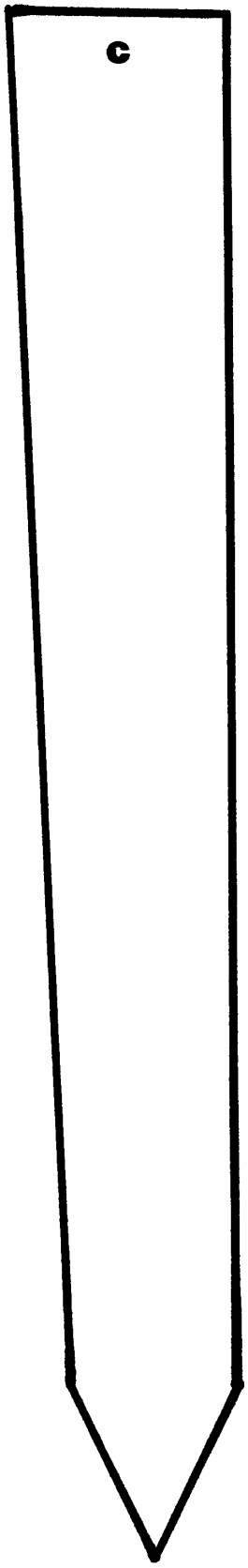
MIDDLE

(abdomen)



LEGS





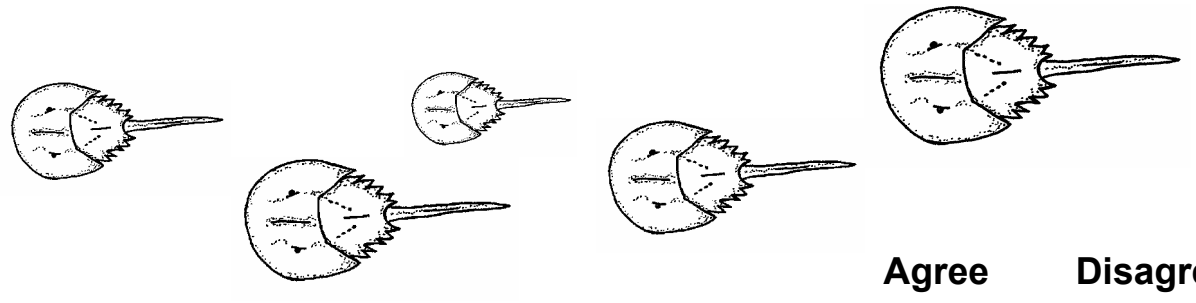
TAIL

(telson)

HORSESHOE CRAB WARM UP

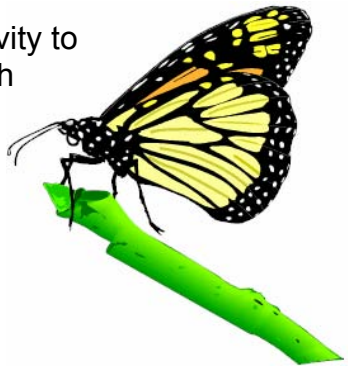
This activity is designed to determine what students already know or believe about horseshoe crabs. It also makes a good post trip assessment as well. Have they changed their minds about previous answers?

Ask the students to answer these questions as a class or individually, before their field trip to the park. Read each of the statements and mark agree or disagree depending on what they believe to be true. Explain to the class that they should try to explain why they made their choices. Of course, there will be incorrect answers! That is okay.



		Agree	Disagree
1.	**Horseshoe crabs are related to spiders.** Horseshoe crabs are not really crabs at all but more closely related to spiders, ticks, and scorpions.	✓	
2.	**Horseshoe crabs have lived on earth for millions of years.** Horseshoe crabs have lived on earth since before the time of dinosaurs.	✓	
3.	**Horseshoe crabs are dangerous.** Horseshoe crabs are harmless. Their tails are not stingers.		✓
4.	**Horseshoe crabs should be picked up by their tails.** Holding a horseshoe crab by the tail can weaken it so that it becomes useless for turning over or comes off altogether.		✓
5.	**Horseshoe crabs have red blood like humans.** Horseshoe crabs have blue, copper based, blood.		✓
6.	**Horseshoe crabs lay their eggs on the sandy beach.** Horseshoe crabs must come up onto the shore to lay their eggs, which will hatch a couple of weeks later.	✓	

MONARCH MIGRATION MANIA



Overview: Birds are not the only creatures that migrate. Use this art activity to teach about Monarch butterflies or migration. Students will make monarch rings and create a migration route through their school.

Theme: Monarch butterflies migrate.

Objectives:
1. Students will be able to describe the concept of migration.
2. Students will be able to identify life stages of a monarch butterfly.

Preparation: Make copies of the monarch worksheets and graphic.

Materials: Monarch worksheets and graphic pattern, crayons, paints and colored pencils, a monarch book (and perhaps a puppet), twist ties or pipe cleaners cut in half, hole punch.

Background information:

Background: Migration is the movement from one area to another and back again. When we think of migration, we generally think of birds, but other creatures migrate as well. Whales and dolphins make seasonal moves for feeding and reproductive purposes. Few of us think of butterflies when we think of migration and yet the diminutive monarch makes an epic journey of up to three thousand miles in search of the right place to spend the winter. It will return to the same roosts used by its great grandparents.

Assateague Island lies on the Atlantic pathway used by these beautiful creatures in their journey south to Mexico for the winter. The butterflies use the island as a resting and feeding point. They can sometimes be seen in great numbers from the beach to the bay in late September or early October. On windy days they may rest on the beach waiting for the right moment to resume their flight south. Look for this delicate creature feeding on seaside goldenrod in the inner dunes or in the salt marsh. This “weed” is an important food source for the monarch.

Procedure:
1. Read a book about monarch butterflies and discuss the content with your class.

2. Make monarch butterfly rings.
    1. Provide each student with monarch graphic pattern.
    2. Instruct students to color the monarchs using black, orange and yellow colored pencils or crayons.
    3. Cut out the butterfly.
    4. Take a hole punch and punch a hole in the Monarch at “X”.
    5. Fold the twist ties or pipe cleaners in half and make a “U”.

6. Students put the “U” around their finger with the ends pointing straight up.
7. Slip the hole in the butterfly (right side up) through one of the twist ties or pipe cleaner ends.
8. As the monarchs rest on the back of the students hand, twist the ties or pipe cleaners together securing the monarch “ring” and making antennae!

3. Once the butterflies rings have been made it is time to talk about migration.
What is migration?
Why do creatures migrate?
What does the monarch butterfly need on its migration to survive?
Why do the monarchs stop at Assateague on their journey?

4. Review each stage of the monarch butterfly....egg-larva or caterpillar-pupa or chrysalis-butterfly.

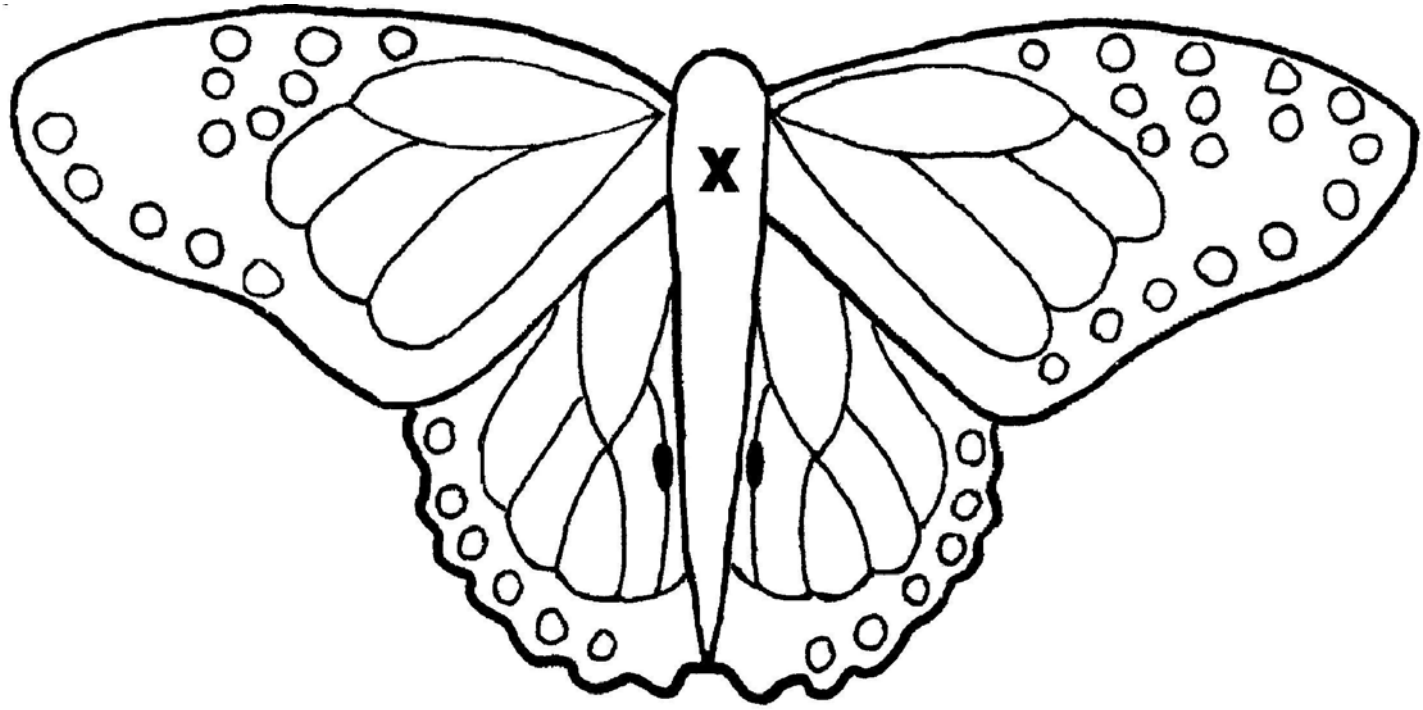
5. Design a migration route with your butterfly class. Start in fall in Canada along the Atlantic coast (your classroom)
   1. Begin flight south making stops for food and rest (other classrooms?) Don’t forget to make a stop at Assateague Island.
   3. Winter over in Mexico (the cafeteria or media room?) Make your winter roost a location where other students can admire the butterflies just as tourists do in Mexico.
   4. In spring begin your trip back. Don’t forget those rest and feeding stops but be sure to include stops on “milkweed” to lay eggs (the playground?).
   5. Remind students that the butterflies that hatch through the summer will only live a few weeks.
   6. Return to your classroom in Canada by the end of summer.

Extensions:

Visit a monarch butterfly website. Try www.monarchwatch.org. Learn how monarchs are being tagged so we can learn more about their migration activities.

Learn about other animals that migrate. Identify whales and dolphins that migrate along the Atlantic Coast near Assateague Island.

Select three very different creatures that make migrations. Examine the migration routes. How are the migrations the same? How do they differ? Why?



1. Color monarch.
2. Cut out.
3. Punch hole at X.
4. Write your name on the back.
5. Make your Monarch ring!

INSIDES OUT OR..... SHELLS ARE SKELETONS!

Seashells are probably more familiar to us than the creature living inside! Many of us may not realize that a living creature created a seashell. Just as humans have a skeleton that supports the body and provides attachment for muscles, so do mollusks and crustaceans. Their shells are exoskeletons, or external “bones.”

Mollusks

The soft bodies of mollusks need their shells for support and protection from predators and environmental conditions such as temperature, tides and weather. Mollusks do not discard their shell and find a new one. Larval (young) mollusks form a shell in their early stages and the shell will continue to grow as the mollusk grows for the rest of its life. A thin tissue layer surrounding the body called the mantle produces the shell. Shell material, calcium carbonate and other organic chemicals, are secreted into a space between the mantle and the shell in a successive building process. Colorful mollusk shells are produced by pigment cells in the mantle. The shape of a shell is genetically inherited.

When a mollusk dies, the shell is the skeletal remains of the creature. Empty shells are used by hermit crabs, which have no shell of their own, or as homes and hiding places for many other creatures. As a shell breaks down, it becomes part of the sand and eventually the minerals are returned to the ocean water. Collection of empty shells should be done in moderation, if at all. Return shells to the beach after examining or studying them. Unfortunately, many species of mollusk have almost vanished due to irresponsible collectors actually taking live mollusks and killing the animal for its shell.

Crustaceans

Crustaceans have an external skeleton or exoskeleton covering their body like a suit of armor. As a crustacean increases in size, its shell does not, so it must molt or shed its shell in order to grow. This periodic molting is hormonally controlled.

A layer of tissue underneath secretes the shell covering of a crustacean. When a crustacean is preparing for molting, the tissue layer separates from inside the hard exoskeleton and begins to secrete a new exoskeleton. At this time, the crustacean has two skeletons! The old outer shell is hard and too small to accommodate the creature, while the new soft inner skeleton is ready to emerge. The old outer skeleton will begin to split at certain weak spots (depending upon species). The crustacean will then pull its body out of the old shell, take in water and stretch the new soft-shell to its full size. The new shell will then harden in a short period of time.

Prior to a molt, crustaceans usually become sluggish and find a sheltered area. Once the creature has molted its shell, their soft bodies are vulnerable and defenseless until their new shell hardens. Some crustaceans eat their old shell to absorb needed calcium salts. Crustaceans are able to regenerate lost limbs through successive molts. Molting tends to be less frequent with age.

EVALUATION
Assateague Island National Seashore

Please share your thoughts with us. We need your help to provide the best educational experience possible.

School: _____

Grade Level: _____ Type of program: _____

Does the program relate to your curriculum? Explain.

_____

_____

Was the material presented at grade level? _____

Did the students enjoy the program? _____

Which activities were most effective and why? _____

_____

_____

Which activities were least effective and why? _____

_____

_____

Rate the extent to which the ranger was able to deliver the information in an interesting and enthusiastic manner.

Excellent Good Fair Poor Unable to Judge

Please comment if your response was "fair, poor, or unable to judge."

_____

_____

Please comment on any changes or additions that could be made to improve the visit.

_____

_____

_____

How did you use pre/post visit activities? Please comment on their effectiveness.

_____

_____

_____

Educators who fill out and return this evaluation to the address listed on the back will be sent additional classroom materials.

Thank you.
Please mail to:

Liz Davis
Education Coordinator
Assateague Island National Seashore
7206 National Seashore Lane
Berlin, MD 21811