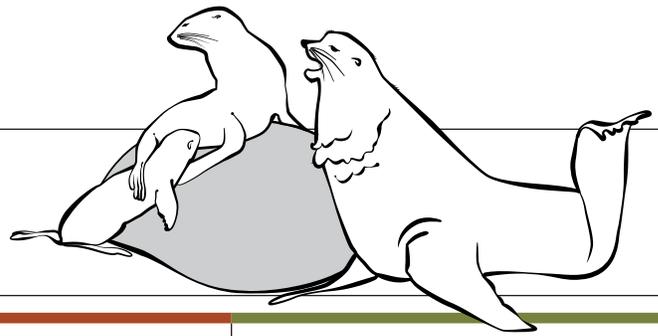


LESSON ONE

What is a fur seal?



Subject Area(s): Life science	Grade Levels: K-6	Presentation – 10 minutes Activities – variable
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Lesson Topics:	Pre-Assessment and characteristics of mammals, pinnipeds, and northern fur seals.	Focus Questions	<ul style="list-style-type: none"> • What is a mammal? • What is a pinniped? • What is a fur seal?
Learning Objectives:	Students will: <ul style="list-style-type: none"> • identify four characteristics of a mammal; • identify the three groups of pinnipeds and list three characteristics of each group 	Key words:	mammal, pinniped, true seal, eared seal, walrus, phocid, otariid, odobenid, northern fur seal, harbor seal, sea lion

ACTIVITIES		ALASKA STANDARDS					Minutes	Grades
		Math K–6	Science K–3	Science 4	Science 5	Science 6		
Activity 1.1	Know, Wonder, Learn (KWL)						10	K-5
Activity 1.2	Mammals, Marine Mammals, and Pinnipeds	K.CC.4–6 K.MD.3 1.MD.7 2.MD.9–10 3.MD.6 4.MD.6 5.MD.6	SA1.1–1.2 SA2.1 SA3.1 SC1.1–1.2 SC2.1–2.2	SA1.1–1.2 SA2.1 SA3.1 SC2.2	SA1.1 SA2.1 SC2.1–2.2	SA2.1 SC2.1	3x15	K-5
Activity 1.3	Describe a Pinniped		SC1.1–1.2 SC2.1–1.2	SC1.1 SC2.2	SC2.1	SA2.1 SC2.1	20	4-6
Activity 1.4	Walk and Swim Like a Pinniped		SC2.2				10	K-2
Activity 1.5	Venn Diagram of Pinnipeds		SC1.1–1.2 SC2.1–2.2	SC1.1 SC2.2	SC2.1	SA2.1 SC2.1	20	K-6
Activity 1.6	Label the Parts of a Pinniped		SC2.2	SC2.2	SC2.2	SA2.1 SC2.1	10	K-6
Activity 1.7	Fur		SA3.1	SA3.1	SA3.1	SA3.1	10	K-6

Targeted Alaska Grade Level Expectations (GLEs)

Math

CC Counting and Cardinality

MD Measurement and Data

Science

Science as Inquiry and Process

SA1 Students develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments.

SA2 Students develop an understanding that the processes of science require integrity, logical reasoning, skepticism, openness, communication, and peer review.

SA3 Students develop an understanding that culture, local knowledge, history, and interaction with the environment contribute to the development of scientific knowledge, and local applications provide opportunity for understanding scientific concepts and global issues.

Concepts of Life Science

SC1 Students develop an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution.

SC2 Students develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.

Laaqudaᖅ: The Northern Fur Seal

Lesson 1:

What is a fur seal?



© Thomas Stream Northern Fur Seal

Lesson 1 provides an overview of the characteristics of a mammal, pinniped and northern fur seal.

What will you learn?

- What is a mammal?
- What is a pinniped?
- What is a northern fur seal?



Photo: NMML/AFSC/NMFS/NOAA

Lesson 1: What is a fur seal?

1

What is a mammal?

- Warm-blooded
- Has hair or fur
- Gives birth to live young
- Nurses young with milk



Mammal = algaᖅ

These are the characteristics of a mammal.

They are warm-blooded, have hair or fur, and nurse their young with milk.

The platypus and echidna (spiny anteater) are the only two mammals that lay eggs.

Marine mammals are mammals that live in marine ecosystems (cetaceans – whales, dolphins, porpoises; pinnipeds – true seals, eared seals, walrus; sirenians – manatees and dugongs; and sea otters). Polar bears and arctic fox are often also counted as marine mammals since they depend largely on the marine environment for their food.

We often get the questions, “Are penguins marine mammals?”

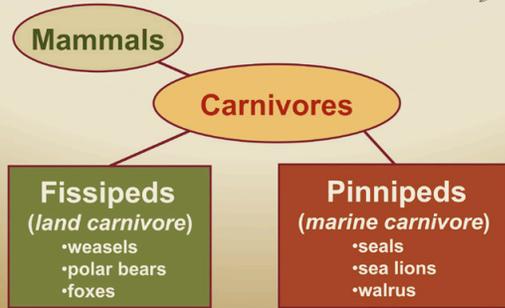
No, penguins are not marine mammals. They are birds that cannot fly but they are not marine mammals.

Photos: fur seal – Rolf Ream, NMML/AFSC/NMFS/NOAA
fox – Pam Goddard, Thalassa
Dancing – Lisa Hiruki-Raring, AFSC/NMFS/NOAA

Lesson 1: What is a fur seal?

2

What is a pinniped?



Lesson 1: What is a fur seal?

3

Within the biological classification of mammals, carnivores are meat-eaters. This group can be broken up into two subgroups, fissipeds (land carnivores) and pinnipeds (marine carnivores).

Fissiped = split foot; Pinniped = fin foot

Fissi = split; Pinni = fin; Ped = foot

Fissipeds or land carnivores include: dogs and related species (e.g. dogs, wolves, coyotes, foxes); raccoons and related species; bears (e.g. polar bears); weasels and related species (e.g. weasels, ferrets, badgers, river otters, sea otters); skunks; cats (e.g. domestic cats, lions, tigers, cougars, lynx); civets and related species; mongooses and related species (e.g. mongoose, meerkat, kusimanse); hyenas and aardwolf

Pinnipeds or marine carnivores include: true seals; fur seals and sea lions (eared seals); walrus

Types of pinnipeds

True Seal

PHOCID (*foe-sid*)



ringed seal puchaaskîjilix

Eared Seal

OTARIID (*oh-ta-rye-id*)



northern fur seal laaqudâx

Walrus

ODOBENID (*oh-do-ben-id*)



Pacific walrus amgaadâx

Lesson 1: What is a fur seal?

4

Pinnipeds are divided into three groups: true seals (phocid seals) – these are seals like harbor seals and ringed seals; **eared seals** (otariid seals) – these are fur seals and sea lions; walrus (odobenid)

PHOCID, OTARIID, and ODOBENID are the scientific names for these pinniped groups. Every animal has only one scientific name, but may have several common names (for example, northern fur seals were called “sea bears” in the past, and the Unangan have several names for fur seals: algamiklûx, laaqudâx).

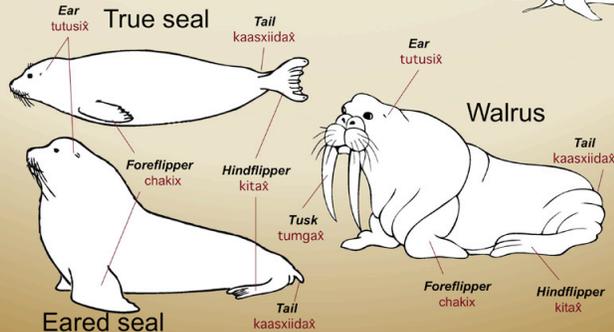
We will go through the main characteristics of each group in the next slide.

Unangan Names: True Seal – agdaâgûx; Eared Seal – laaqudâx (fur seal) & qawâx (sea lion); Walrus – amgaadâx

Most Unangan names refer to a specific type of seal. Examples: Qawâx – sea lion; Isûx – harbor seal; Iglagayâx - ribbon seal

Photos: John Moran, NMML/AFSC/NMFS/NOAA

Pinniped characteristics



Lesson 1: What is a fur seal?

5

Things to point out:

Ears – true seals and walrus don’t have external ear flaps – they just have a hole in the side of the head. Eared seals have small flaps.

Foreflippers and hindflippers – true seals have short foreflippers, which are mostly used for steering; the hindflippers are used to propel the seal when swimming. Eared seals and walrus have large foreflippers. Eared seals use foreflippers for propulsion when swimming (the animal “flies” through the water), while walrus swim mostly with hindflippers, using foreflippers as rudders.

Locomotion on land – true seals cannot stand on all four flippers because their hindflippers are rotated backwards; when they are on land, they move on their stomach, pulling themselves forward with their foreflippers. Eared seals and walrus can stand on all four flippers and walk when they are on land.

Tail – All three groups have a small tail, even though it may not be visible in this picture.

There are other more subtle differences between the groups (e.g., true seals may have patterns on their fur, like spots, rings or bands, while eared seals and walrus do not).

Source: Figure adapted from Wynne, K. Marine Mammals of Alaska.

How can you tell them apart?



- True seal (PHOCID)
 - No external ears
 - Small foreflippers
 - Drag hindflippers to move on land
- Eared seal (OTARIID)
 - External ears
 - Large foreflippers
 - Can walk on all fours on land

Lesson 1: What is a fur seal?

6

Note the pattern on the fur of the true seal (no pattern on eared seal). True seal has a "torpedo" or sausage shape; eared seal has a long neck in relation to the body. The true seal in this picture is a harbor seal. The eared seal is a California sea lion.

Photo: Harriet Huber, NMML/AFSC/NMFS/NOAA

What is a northern fur seal?

Scientific name: *Callorhinus ursinus*
Callorhinus = beautiful nose
ursinus = bear-like
 Unangan name: laaquadaax

Males – aataagiix
 Length 2.1 m (6.9 ft)
 Weight 185-275 kg (407-605 lbs)

Females – maatkaax
 Length 1.4 m (4.7 ft)
 Weight 30-50 kg (66-110 lbs)

Pups – laaquadaax
 Weight 5.4 kg (12 lbs) at birth,
 born in June; one pup is born per year.



Adult males are **four times** larger than females!

Lesson 1: What is a fur seal?

7

The northern fur seal is one type of eared seal. Emphasize the size difference between the male and the female (shown in the picture). Males are much larger than females. FEMALES GIVE BIRTH TO ONE PUP EACH YEAR! If the pup dies or is taken for food, the female does not give birth to another pup. Male fur seals have multiple Unangan names depending on the age of the male. See references for list of Unangan words.

Source for measurements: AFSC/NMML website, Northern Fur Seal page, http://www.afsc.noaa.gov/nmml/species/species_nfs.php

Photo: Chuck Fowler, NMML/AFSC/NMFS/NOAA

Summary

- Fur seals are mammals
- Fur seals are pinnipeds (fin-foot)
- Three types of pinnipeds
 - True Seal (PHOCID)
 - Eared Seal (OTARIID)
 - Walrus (ODOBENID)
- Fur seals are eared seals (OTARIID)



Lesson 1: What is a fur seal?

8

The northern fur seal is one type of eared seal. What is next?? Learn about the Unangan who have known about the fur seals for thousands of years.

Photo: Lisa Hiruki-Raring, AFSC/NMFS/NOAA

ACTIVITY 1.1

CHART

Know, Wonder, Learn

<p>Tell me what you <u>KNOW</u> about northern fur seals in general</p>	
<p>What do you <u>WONDER</u> about northern fur seals</p>	
<p>What have you <u>LEARNED</u> about northern fur seals</p>	

Mammals, Marine Mammals, and Pinnipeds

OBJECTIVE

Students will identify physical characteristics of mammals, marine mammals, and pinnipeds.

TIME REQUIRED

Three sections taking 15 minutes each. Works best with groups of six to eight students.

BACKGROUND

Mammals are animals that have hair or fur, nurse their young with milk, give birth to live young, and are warm blooded. Marine mammals are mammals that live in marine (salt water) ecosystems. Marine mammals have all the characteristics of mammals but they live all or much of their lives in the ocean. There are four main groups of marine mammals:

- cetaceans (si-TAY-shens) – whales, dolphins, porpoise
- pinnipeds (PINN-i-peds) – true seals, eared seals, walrus
- sirenians (si-REHN-ee-ans) – manatees and dugongs
- marine fissipeds (FIS-si-peds) – sea otters, polar bears

Pinni-ped = “fin-foot”

Pinnipeds are marine carnivores (meat-eaters) and are divided into three main groups:

- True seals (phocid) – do not have an external ear flap; sausage shaped body, can’t stand on all four flippers (crawls on land), swim with hind flippers (example – harbor seal)
- Eared seals (otariid) – have an external ear flap, can walk on all four flippers on land, swim using front flippers for propulsion, have long neck and large flippers (example – Steller sea lion, northern fur seal)
- Walrus (odobenid) – no external ear flap, but can walk on all four flippers on land, swim with hind flippers for propulsion

In this activity, students will go through three exercises:

1. “What is a mammal?” – Discuss characteristics of mammals and sort animals into mammals and non-mammals.
2. “What is a marine mammal?” – Discuss characteristics of marine mammals and sort animals into marine mammals and other mammals.

3. “What is a pinniped?” – Discuss characteristics of pinnipeds and sort pinnipeds into true seals, eared seals, and walruses.

To simplify the activity for younger students, students can sort animals into mammals and non-mammals, then pick out marine mammals and pinnipeds from the pile of mammals.

MATERIALS

- Pictures or clipart of non-mammals, mammals and marine mammals (worksheets 1.2.1-1.2.3). For younger students (K-1), you can use manipulatives – plastic animals, or stuffed animals (a variety of mammals, marine mammals, and non-mammals). For older students, photocopy the worksheets with mammals, marine mammals, and non-mammals, and cut them into individual squares
- Worksheet 1.2.4 a+b, (“What is a mammal?”) – these worksheets can be cut to provide two half-sheet worksheets for young students
- Worksheets 1.2.5 a+b, (“What is a marine mammal?”)
- Student Worksheets 1.2.6, 1.2.7 (“What is a pinniped?”)

PROCEDURES

This series of three activities is great for grades K-1. Students can work individually or in small groups. The activity can be set up as a station facilitated by one teacher, with a group of six to eight students

WHAT IS A MAMMAL?

- Ask students “What is a mammal?”
- Go through the four main characteristics of a mammal and list on the board:

Has fur or hair

Most mammals have live babies*

Nurses young with milk

Is warm-blooded (body is warm from the inside)

- Platypus and echidna (spiny anteater) are the only mammals that lay eggs.
- Put the Mammal Talking Points 1.2.4 up on the board.

PRODECURES continued

- Using one of the pictures of a mammal, or a stuffed mammal, talk about each of the characteristics. Hold up other pictures of mammals or non-mammals and ask the class if the animal is a mammal or a non-mammal.
- Give each student two to four small pictures (from worksheets 1.2.1 – non-mammals and 1.2.2 – mammals). Ask the students to sort the pictures into groups of mammals and non-mammals.
- Grades K-1 – hand out Worksheet 1.2.4 a or b (this can be cut in half so that you have two small worksheets, 8.5"x5.5" each).
- For worksheet 1.2.4 a or b, ask students to circle the mammals.
- Grades 2-3 – Using a book from the library, students can write a paragraph or short report on a mammal. Reports can include where the animal lives, what time of year it has its babies, how many babies it has, and what it eats.
- Grades 4-6 use stuffed animals or pictures to review characteristics of mammals, marine mammals, and pinnipeds.

WHAT IS A MARINE MAMMAL?

- Ask students "What is a marine mammal?"
 - ◆ Marine mammals are mammals that live in salt water.
- Review the four main characteristics of a mammal and list on the board:
 - ◆ Has fur or hair
 - ◆ Most mammals have live babies
 - ◆ Nurses young with milk
 - ◆ Warm-blooded (body is warm from the inside)
 - ◆ Most marine mammals live in salt water but there are some (Baikal seals, Saimaa seals, Caspian seals, some harbor seals, and river dolphins) that live in freshwater lakes, and marine mammals can go into fresh water.
 - ◆ Marine mammals breathe air (unlike fish, which get their oxygen from the water)
 - ◆ There are four main groups of marine mammals:
 - Whales, dolphins and porpoise (CETACEANS – "si-TAY-shens")
 - Seals, sea lions and walrus (PINNIPEDS – "PINN-i-peds")
 - Manatees and dugongs (SIRENIANS – "si-REHN-ee-ans")
 - Sea otters, polar bears (Marine FISSIPEDS – "FISS-i-peds")

- Using one of the pictures of a marine mammal, or a stuffed marine mammal, talk about each of the characteristics. Hold up other pictures of marine mammals, fish, or other mammals, and ask the class if the animal is a marine mammal.
- Give each student three to six small pictures (from worksheets 1.2.1 – non-mammals, 1.2.2 – mammals and 1.2.3 – marine mammals). Ask the students to sort the pictures into groups of marine mammals and non-marine mammals. Can also use plastic animals to sort.
- Grades K-1 – hand out Worksheet 1.2.5 a or b (this can be cut in half so that you have two small worksheets, 8.5"x 5.5" each).
 - ◆ For worksheet 1.2.5 a or b, ask students to circle the marine mammals.
- Grades 2-3 – Using a book from the library, students can write a paragraph or short report on a marine mammal. Reports can include where the animal lives, what time of year it has its babies, how many babies it has, and what it eats.

WHAT IS A PINNIPED?

- Ask students "What is a pinniped?"
 - ◆ Pinniped means "fin-foot" and refers to a group of animals that includes true seals, eared seals and walrus.
- Hand out pictures (or plastic stuffed animals) of true seals, eared seals, and walrus. Ask students to look at their animal and talk about its characteristics. Have students sort themselves into groups based on whether they have a true seal, an eared seal, or a walrus. Go over the characteristics of each group:
 - ◆ True seal
 - No external ear flap (just a hole where the ear is)
 - Pulls itself over land on its stomach
 - Swims with hind flippers
 - ◆ Eared seal
 - Has external ear flap
 - Can walk on all four flippers on land
 - Swims with front flippers
 - ◆ Walrus
 - No ear flap
 - Can walk on all four flippers
 - Swims mostly with hind flippers, steering with front flippers
 - Both males and females have tusks

Laaqudaâ: The Northern Fur Seal

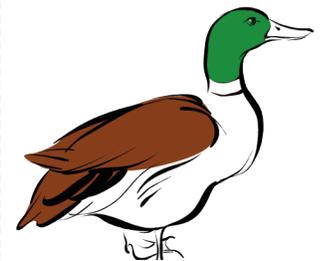
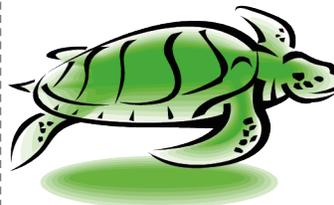
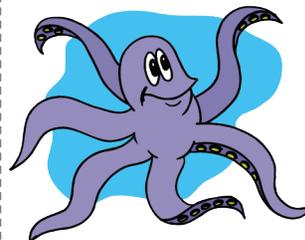
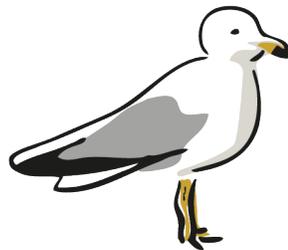
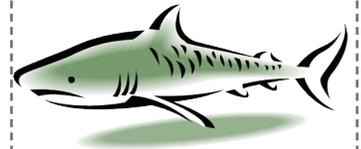
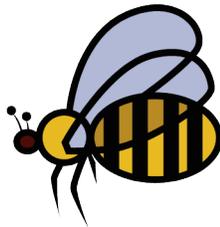
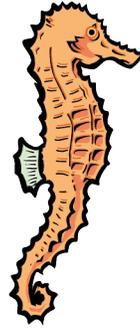
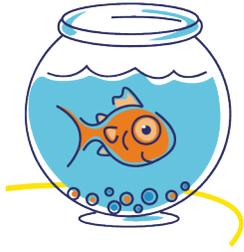
- Grades K-1 – hand out Worksheet 1.2.6 a or b (this can be cut in half so that you have two small worksheets, 8.5”x5.5” each) and student worksheet 1.2.7 a or b.
 - ◆ For worksheet 1.2.6 a or b, ask students to circle the pinnipeds.
 - ◆ For worksheet 1.2.7 a or b, ask students to circle the true seals, put squares around the eared seals and count the walrus. Have the students color in the number of boxes for the number of true seals, eared seals and walrus they counted. This activity can also be done in a more hands-on way by giving students pictures of true seals, eared seals, and walruses and making a graph on the white board.
- Grades 2-3 – Students can write a paragraph or short report on a pinniped, using a book from the library. Reports can include where the animal lives, what time of year it has its babies, how many babies it has, and what it eats.
- Grades 4-6 – Students complete worksheet 1.2.8 to review the characteristics of a mammal, marine mammal and pinniped.

DISCUSSION

Review the characteristics of mammals, marine mammals, and pinnipeds.

EXTEND AND EXPLORE

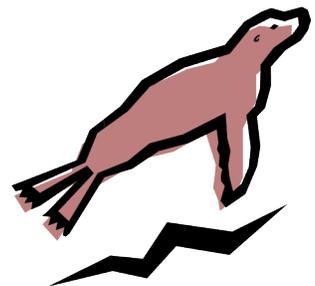
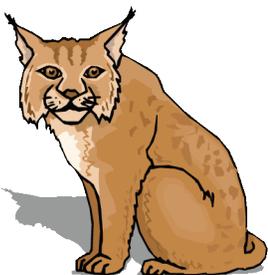
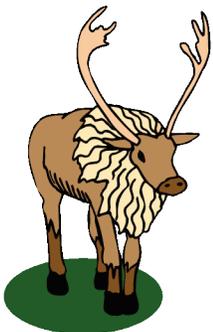
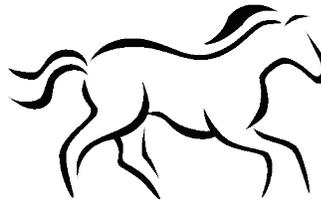
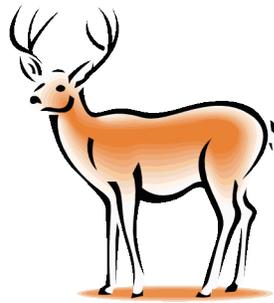
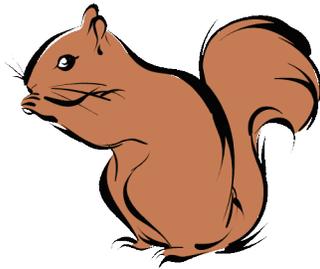
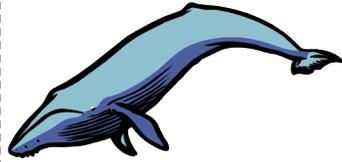
For any of the activities, graph the results (e.g. comparing the number of non-mammals to mammals).

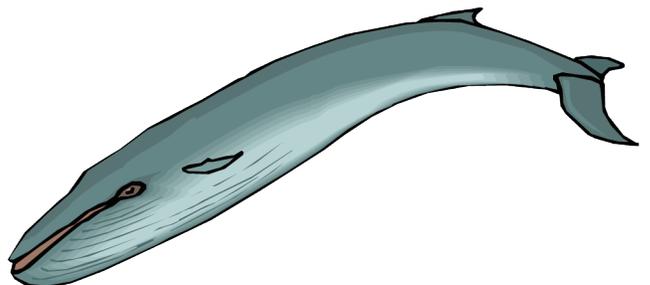
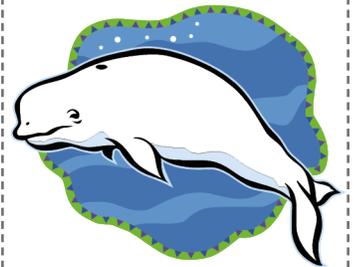
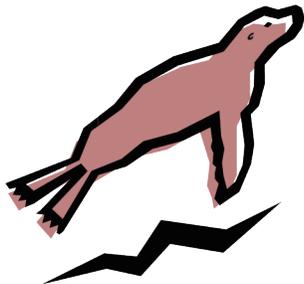
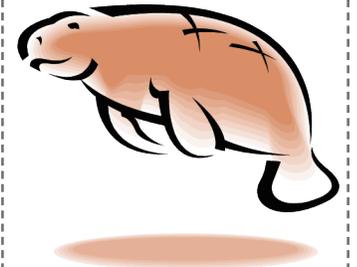
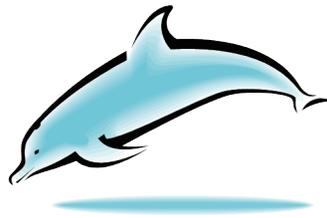
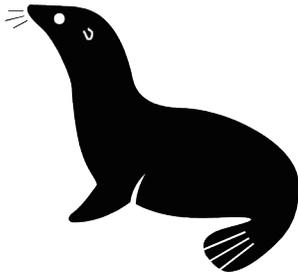
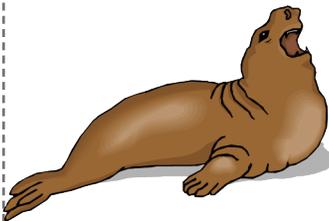
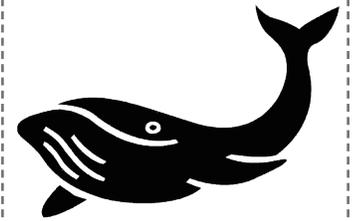
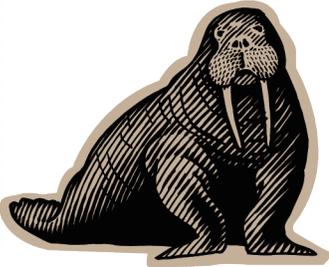
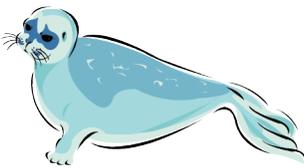


ACTIVITY 1.2

WORKSHEET 1.2.2

Mammals





What is a mammal?

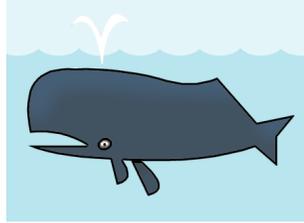
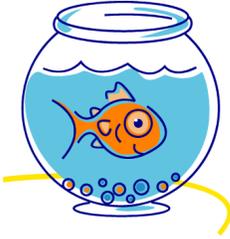
- Has fur or hair
- Most mammals have live babies
- Nurses young with milk
- Warm-blooded (body is warm from the inside)

ACTIVITY 1.2

WORKSHEET 1.2.4 a

What is a Mammal?

Circle the mammals.

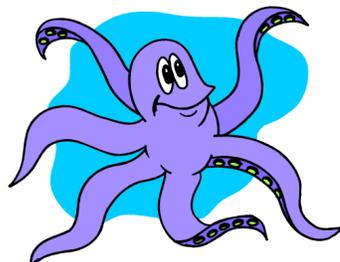
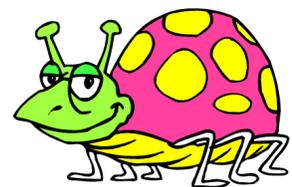


ACTIVITY 1.2

WORKSHEET 1.2.4 b

What is a Mammal?

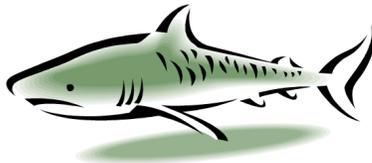
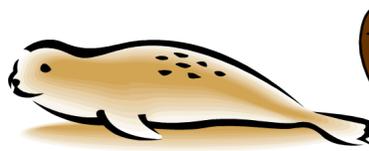
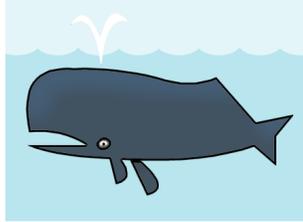
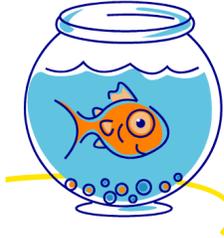
Circle the mammals.



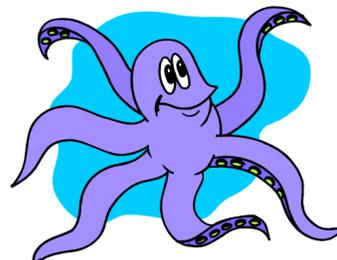
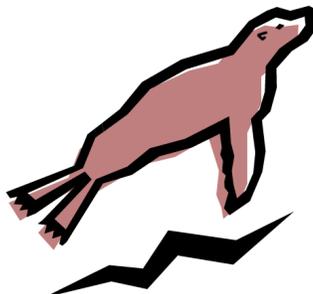
What is a marine mammal?

- Most marine mammals live in salt water
- Breathes air
- Has fur or hair
- Has live babies
- Nurses young with milk
- Warm-blooded (body is warm from the inside)

Circle the marine mammals.



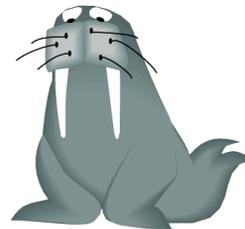
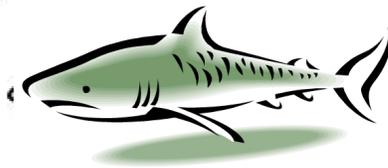
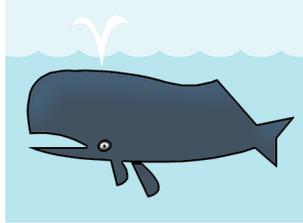
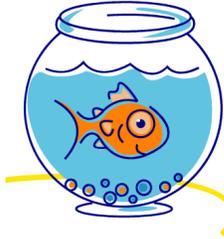
Circle the marine mammals.



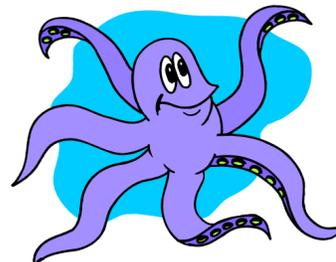
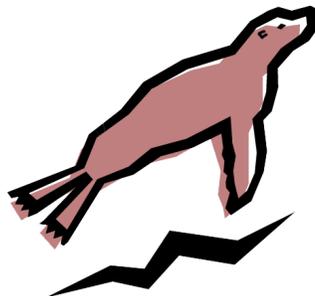
What is a pinniped?

- Pinniped = Fin- foot
- True seal, eared seal, walrus
 - ◆ True seal
 - No ear flap
 - Crawls on land
 - Swims with hind flippers
 - ◆ Eared seal
 - Ear flap
 - Can walk on all four flippers
 - Swims with front flippers
 - ◆ Walrus
 - No ear flap
 - Can walk on all four flippers
 - Male and female have big tusks

Circle the pinnipeds.



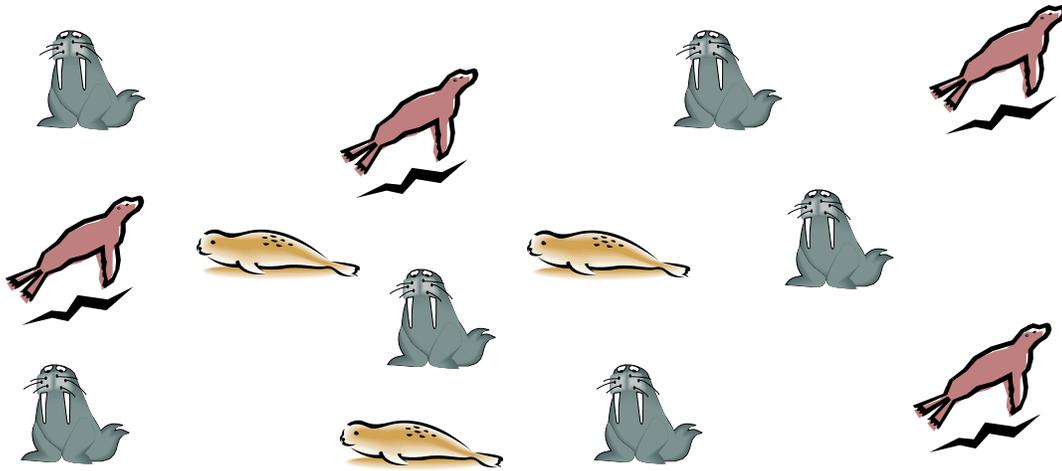
Circle the pinnipeds.



Circle the true seals.

Put squares around the eared seals.

Count the number of walruses.



Show how many true seals, eared seals and walruses you found.

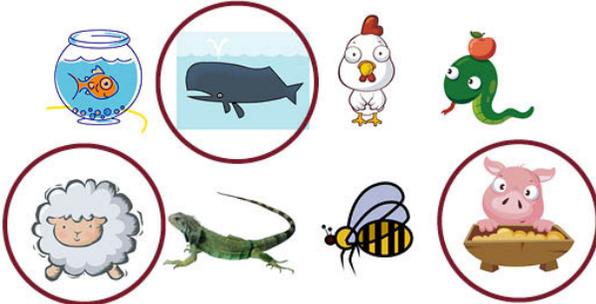


ACTIVITY 1.2 TEACHER KEYS

Elementary Curriculum: Grades K-6

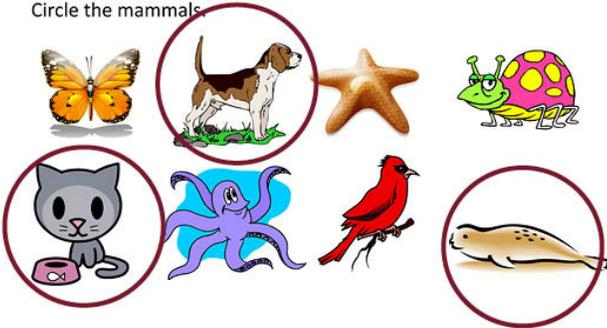
ACTIVITY 1.2 WORKSHEET 1.2.4 a What is a Mammal?

Circle the mammals.



ACTIVITY 1.2 WORKSHEET 1.2.4 b What is a Mammal?

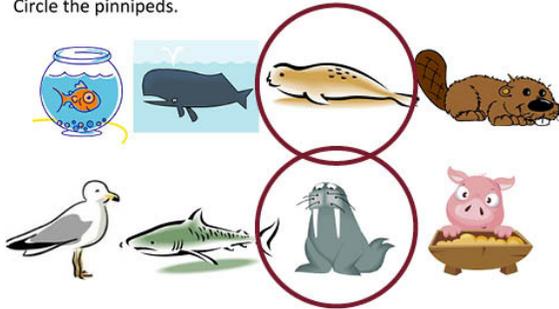
Circle the mammals.



Laaqudaâ: The Northern Fur Seal

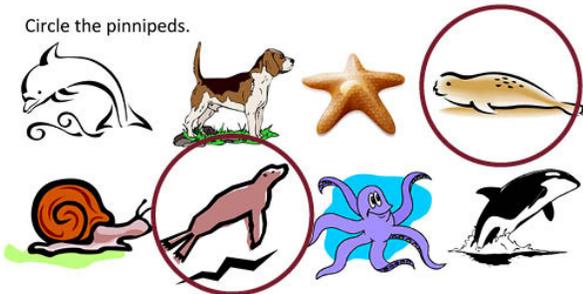
ACTIVITY 1.2 WORKSHEET 1.2.6a What is a Pinniped?

Circle the pinnipeds.



ACTIVITY 1.2 WORKSHEET 1.2.6b What is a Pinniped?

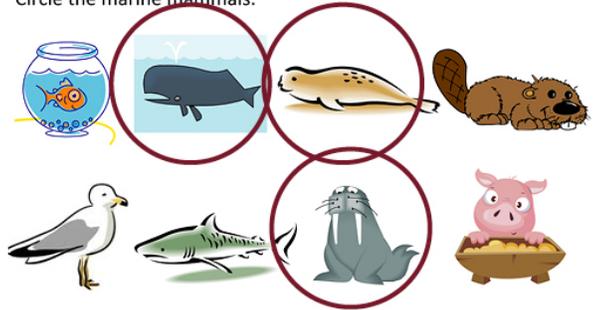
Circle the pinnipeds.



Laaqudaâ: The Northern Fur Seal

ACTIVITY 1.2 WORKSHEET 1.2.5 a What is a Marine Mammal?

Circle the marine mammals.



ACTIVITY 1.2 WORKSHEET 1.2.5 b What is a Marine Mammal?

Circle the marine mammals.



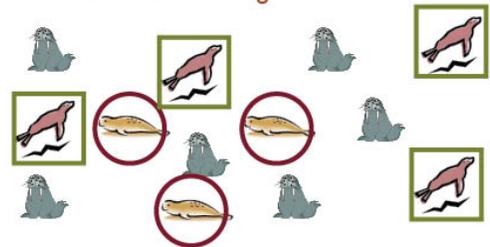
Elementary Curriculum: Grades K-6

ACTIVITY 1.2 WORKSHEET 1.2.7 Graphing

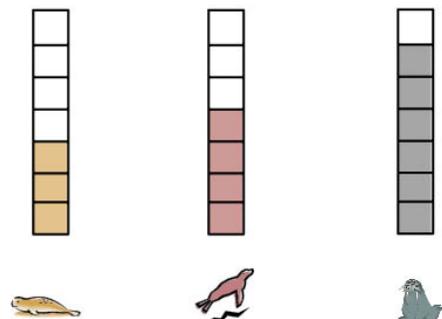
Circle the true seals.

Put squares around the eared seals.

Count the number of walrus. **6**



Show how many true seals, eared seals and walrus you found.



What is a mammal?

There are four characteristics of a mammal.

List as many as you can.

1. _____
2. _____
3. _____
4. _____

Name at least three marine mammals. Note: Penguins are not marine mammals.

1. _____
2. _____
3. _____

Pinnipeds are a type of marine mammal. Name at least three pinnipeds.

1. _____
2. _____
3. _____

What is a mammal? ANSWERS MAY VARY

There are four characteristics of a mammal.
List as many as you can.

1. has hair or fur
2. most mammals have live babies
3. nurses young with milk
4. warm-blooded (body is warm from the inside)

Name at least three marine mammals.

1. northern fur seal
2. orca whale
3. sea otter

Pinnipeds are a type of marine mammal. Name at least three pinnipeds.

1. northern fur seal
2. harbor seal
3. walrus

Describe A Pinniped

OBJECTIVE

Students will identify physical characteristics of different types of pinnipeds in Alaska.

TIME REQUIRED

20 minutes

BACKGROUND

Pinnipeds are separated into three general groups: true seals (phocid); eared seals (otariid); and walrus (odobenid). Students will identify physical characteristics of each type of seal pictured and sort them into common groups.

MATERIALS

- Pictures of northern fur seal, Steller sea lion, harbor seal, and walrus (optional: include pictures of ice-associated seals – ringed, bearded, ribbon, spotted seals)
- Marine mammal reference books (from library) or *Guide to Marine Mammals of Alaska* by Kate Wynne, for older students (grades 4-6)
- T-chart
- List of Unangan names for seals

PROCEDURES

- For younger grades (K-2 or K-3) this activity can be completed as a class. For older grades, divide students into small groups or pairs and give each group a picture of a pinniped. At minimum, northern fur seal, Steller sea lion, harbor seal, and walrus should be used. Use one animal as an example and go through the process with the whole class before they work independently. Depending on the age of the students, you can choose to set up four or five characteristics that they need to describe (e.g. body shape, head shape, length of flippers, presence/absence of ear flaps, standing on all four flippers), or have the students come up with their own categories.

- ◆ Tell students to write down physical characteristics that they see for their animal
 - Body shape
 - Length and shape of flippers
 - Shape of head, presence or absence of ear flaps
 - Patterns on fur
 - Whether the animal can stand up on its flippers or lies on its stomach
 - Shape of flippers
 - Any other characteristics they can come up with
- ◆ For older students, ask them to use reference books to look up facts about the animal, including length, weight, distribution
- ◆ When groups are finished, ask them to present their results to the class. Create a class summary of characteristics
- ◆ Have a student from each group stand at the front of the class with a picture of their animal. Ask the class to sort students into groups based on common characteristics of their animal.

DISCUSSION

Review the main characteristics of true seals, eared seals, and walrus.

EXTEND AND EXPLORE

- Ask each group to take the picture of their animal to an elder in the community and ask about the Unangan, non-English, or other traditional name for the animal and any knowledge about the animal.
- Ask students to research the correct format for citing a book. Use *Guide to Marine Mammals of Alaska* as an example.

REFERENCES

Wynne, Kate. Folkens, Pieter. *Guide to Marine Mammals of Alaska*. Alaska Sea Grant Program. Fairbanks, AK: University of Alaska Fairbanks, 2009.

Bergsland, Knut. *Aleut Dictionary*. Fairbanks, AK: University of Alaska Press, 1994.

ACTIVITY 1.3

WORKSHEET 1.3.1

Describe a pinniped:
Pictures of true seals



Harbor seal



Harbor seal



Spotted seal



Spotted seal



Ribbon seal



Ribbon seal



Ringed seal



Ringed seal

ACTIVITY 1.3

WORKSHEET 1.3.2

Describe a pinniped:
Pictures of eared seals



Fur seal (male)



Fur seal (male and female)



Fur seal (female)



Fur seal (female)



Sea lion (male)



Sea lion (male and female)



Sea lion (female and pup)



Sea lion (female)

ACTIVITY 1.3

WORKSHEET 1.3.3

Describe a pinniped:
Pictures of walrus



Walrus



Walrus

Note: numbers in parentheses refer to page numbers in the *Aleut Dictionary* (Knut Bergsland). Refer to P. 727 for words for different types of seal, fur seal and sea lion.

Harbor seal

Isuġ – (214) – harbor seal

Spotted seal

ukutuġ – (432) – small white hair seal with black spots (shows up in winter, sticks head up and looks around) – possibly spotted seal

Ribbon seal

iglagayaġ - (179) – ribbon seal

tuġtuġ (403) – small kind of seal (comes from north in cold weather), probably ribbon seal

Ringed seal

puchaaskiġilix (288) – ringed seal

Fur seal

Laaqudaġ – (254) – fur seal (eastern dialect)

Algamikluġ – (52) – fur seal (western dialect)

Laaqudaaġ - (254) – fur seal pup

Sea lion

Qawaġ – (313) – Steller sea lion

Walrus

Amgaadaġ – (64) – walrus

ACTIVITY 1.3

WORKSHEET 1.3.5

Describe a pinniped

Animal Name:

Characteristic	Description

ACTIVITY 1.3 **TEACHER KEY 1.3.5** Describe a pinniped*

Animal Name: Northern fur seal	
Characteristic	Description
Body shape	Big and bulky (adult male); long and sleek, with long neck (female, juvenile)
Head shape	Small in comparison to the rest of the body; nose very short and pointed; eyes large. External ear flaps.
Flipper shape	Large foreflippers; fur stops partway down the flipper. Hindflippers can rotate forward under the body so that the fur seal can stand up on all four flippers. Hindflippers are long and narrow and have very very long toes that can be bent. Hindflippers have nails or claws that they use to scratch themselves.
Fur	Fur is dark and thick; on males there is a thicker area of fur on the neck and head. Fur has two layers, a dense underfur and longer guard hairs. Juveniles and females have a silvery-brown coat which is lighter on the underside of the animal, and lighter cream-colored "cheek patches." Male fur color is more uniformly dark brown. Pups have black fur at birth. Pups molt into their first silvery-brown coat by October of their first year.
<i>(example of information that students can get from reference books)</i>	
Length	
Weight	
<i>(can also add in characteristics that you know personally)</i>	
Meat	Darker than sea lion; tastes different than sea lion
Intestine	Used to make waterproof clothing

* create a key for each seal

Walk and Swim Like a Pinniped

OBJECTIVE

Students will use their bodies to learn the difference in how seals and fur seals walk and swim by moving themselves.

TIME REQUIRED

10 minutes

BACKGROUND

Fur seals and harbor seals are mammals, marine mammals, and pinnipeds. But fur seals are otariids (eared seals) and harbor seals are phocids (true seals). The characteristics of each group are covered in Activity 1.2 (Mammals, Marine Mammals, and Pinnipeds) but you can review them here:

True seal (phocid):

- No external ear flap (just a hole where the ear is)
- Pulls itself on stomach when on land, using its foreflippers
- Propels itself through water with hind flippers (front flippers are used to steer)

Eared seal (otariid):

- Has external ear flap
- Walks on all four flippers on land
- Swims with front flippers

The shape of the pinniped's body affects the way it moves on land and in the water.

A harbor seal (true seal) has a torpedo-shaped body. Its hind flippers are behind the body (not rotated underneath it) so it cannot stand on all four flippers but instead rests on its stomach when it is on land. A harbor seal uses its hind flippers to propel itself through the water.

A fur seal (eared seal) is able to stand up on four limbs on land. Its flippers are larger and the hind flippers rotate forward under its body. In the water, a fur seal uses its large front flippers to "fly" through the water, pulling its body through the water.

MATERIALS

- Picture of fur seal (standing on land) or a stuffed fur seal toy
- Picture of harbor seal (on land) or a stuffed harbor seal toy

PROCEDURE

Walk Like a Seal

- Show students the pictures of the fur seal and harbor seal, and ask them to describe the differences between the two pinnipeds. Ask them to describe differences in the shape of the body, head, and flippers, and the size of the flippers, and the difference in how the pinnipeds are when they are on land (fur seal is "standing up," harbor seal is "lying down").
- Describe how fur seals can walk on all four flippers, while harbor seals crawl more on their tummies. Tell students that they are going to find out how seals move on land.
- Have students move from one end of the room to the other. In smaller groups or with younger students, you can have the students move in a big circle
- Demonstrate how fur seals move on land (have students walk on hands and knees). Ask the students to go across the room walking like a fur seal.
- Demonstrate how harbor seals move on land (have students lie on their stomach and pull themselves forward with their arms). Ask the students to go across the room moving like a harbor seal.
- You can make a game of this, by saying "harbor seal" or "fur seal" and having them show you how the animals move on land.

Swim Like a Seal

- Show the students the pictures of the fur seal and harbor seal again, and ask them how they think each pinniped swims underwater. Emphasize that the body shape, and the size of the flippers, might give them clues to how they swim.
 - ◆ Describe how fur seals use their large foreflippers to "fly" through the water – they pull their body through the water. You can relate this motion to students swimming with their arms underwater. Describe how harbor seals use their hindflippers to propel themselves underwater – they move their hindflippers from side to side to push the body through the water, and use their foreflippers to steer.
 - ◆ Demonstrate how fur seals swim underwater (have students walk while using their arms to flap). Ask students to go across the room swimming like a fur seal.

- ◆ Demonstrate how harbor seals swim underwater (here, we have students hold their hands by their sides and take shuffling steps with their feet to show that harbor seals swim with their hind flippers). Ask students to go across the room swimming like a harbor seal.
- You can make a game of this, by saying “harbor seal” or “fur seal” and having them show you how the animals swim underwater.

DISCUSSION

At the end of this activity, gather students around and ask why they think the pinnipeds have different ways of moving on land and underwater.

The way a pinniped moves on land or underwater depends on the pinniped’s body shape. Fur seals have larger foreflippers and can rotate the hindflippers under the body to walk on all fours. True seals have small foreflippers and cannot rotate the hindflippers under the body.

Older students can look up facts about pinniped swimming speed on the Internet.

EXTEND AND EXPLORE

Watch video clips of seals swimming.

- On TeacherTube: http://www.teachertube.com/viewVideo.php?video_id=290725
- On YouTube: <http://youtu.be/JR2o56tGtuY>
- On Vimeo: <http://vimeo.com/63205204>

Venn Diagram of Pinnipeds

OBJECTIVE

Students will identify similarities and differences of pinnipeds in Alaska.

TIME REQUIRED

20 minutes

BACKGROUND

Pinnipeds are separated into three general groups: true seals (phocid), eared seals (otariid) and walruses (odobenid). This exercise can be done with three specific examples of each group (e.g. harbor seals, fur seals, walrus) or with characteristics of the group as a whole.

MATERIALS

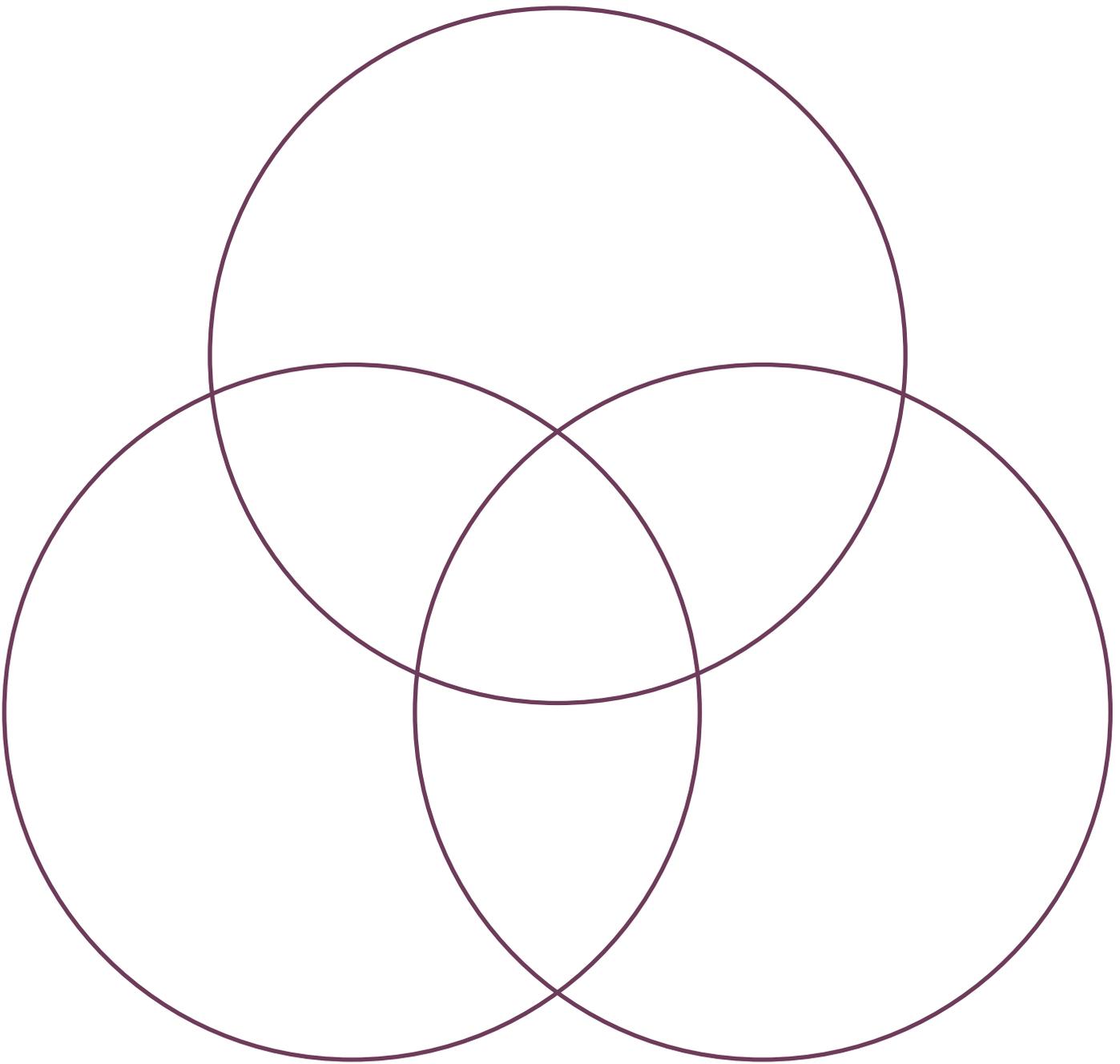
- Class summary from Activity 1.3 – Describe a pinniped
- Venn Diagram chart

PROCEDURES

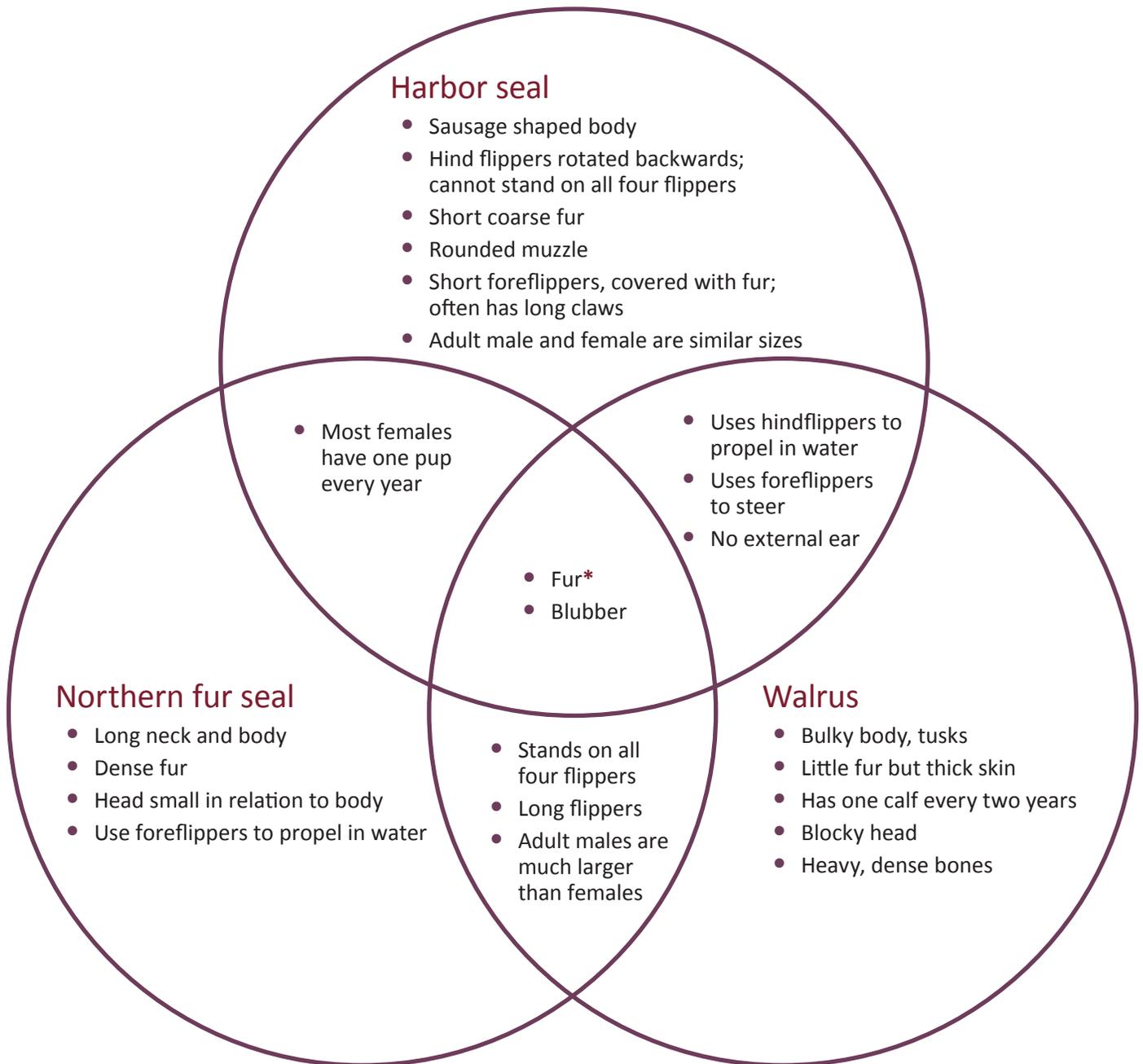
- This activity can be used as an assessment by providing the students with the characteristics and asking them to place them in the appropriate area of the Venn Diagram.
- For younger grades (K-2 or K-3) complete Worksheet 1.5.1 as a class. For older grades, the class summary from Worksheet 1.3.5 "Describe a Pinniped" can be handed out or shown on the projection screen.
 - ◆ Use descriptions of species from Activity 1.3; choose one eared seal, one true seal, and walrus.
 - ◆ Fill in the Venn diagram with the characteristics of the three pinniped groups, showing characteristics that the three groups have in common and characteristics that are unique to each group.

DISCUSSION

Discuss similarities and differences between the three groups of pinnipeds.



ACTIVITY 1.5 **TEACHER KEY 1.5.1** Venn Diagram



**Fur: True seals and sea lions have short, coarse fur. Fur seals have two layers of fur, dense underfur and outer guard fur. Walrus have very little fur.*

Label the Parts of a Pinniped

OBJECTIVE

Students will learn the parts of a pinniped by labeling a diagram.

TIME REQUIRED

10 minutes

MATERIALS

Worksheet – Label the parts of a pinniped in English or Unangan.

PROCEDURE

Hand out the worksheet and have students either put the letter corresponding to the body part in the appropriate box or write in the name of the body part.

EXPLORE AND EXTEND

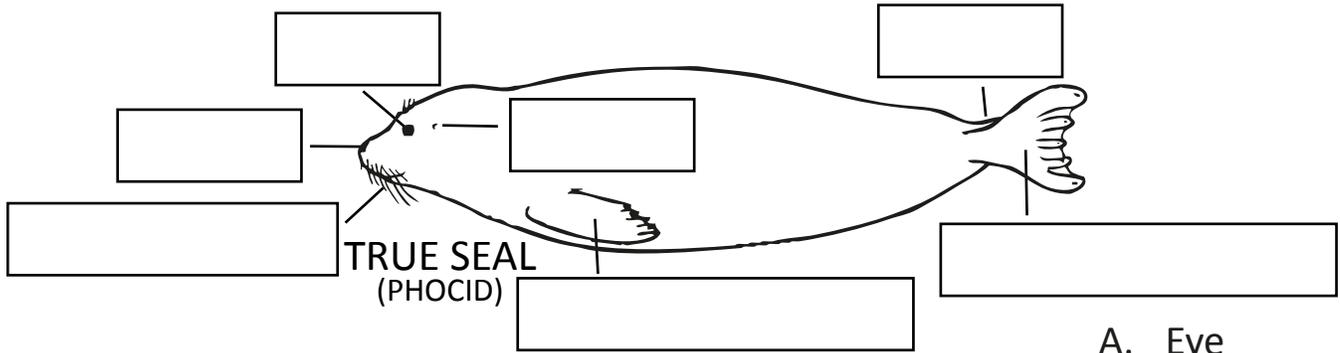
Using Worksheet 1.6.1 and the list of Unangan words, have students look up the Unangan names for the body parts (see PowerPoint slide) and write these names in the appropriate boxes.

ACTIVITY 1.6

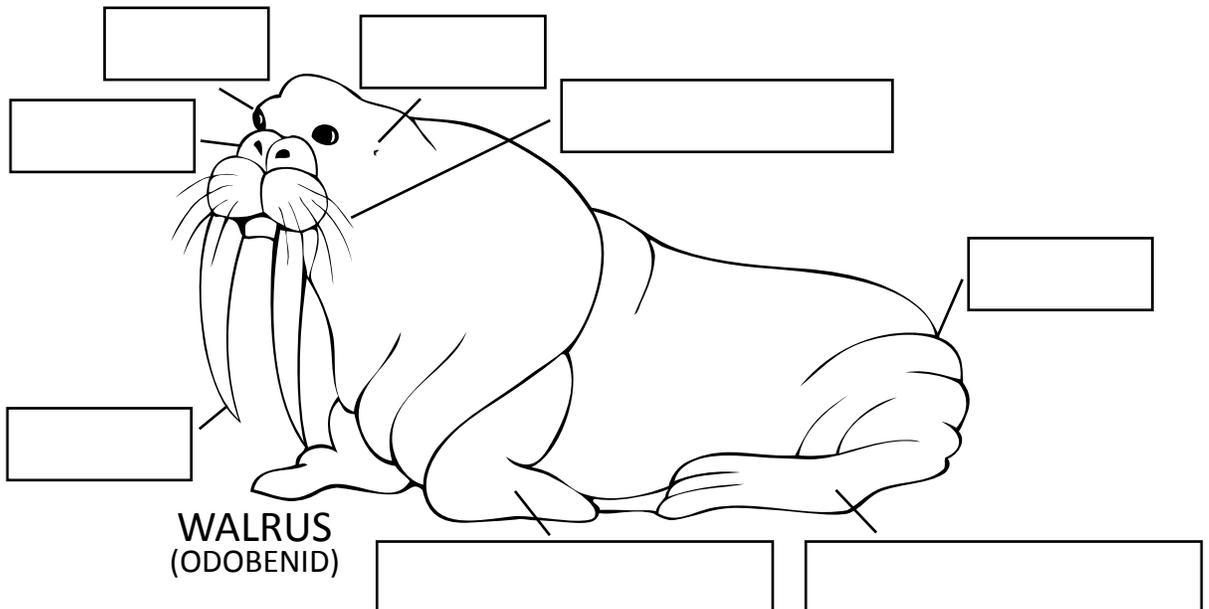
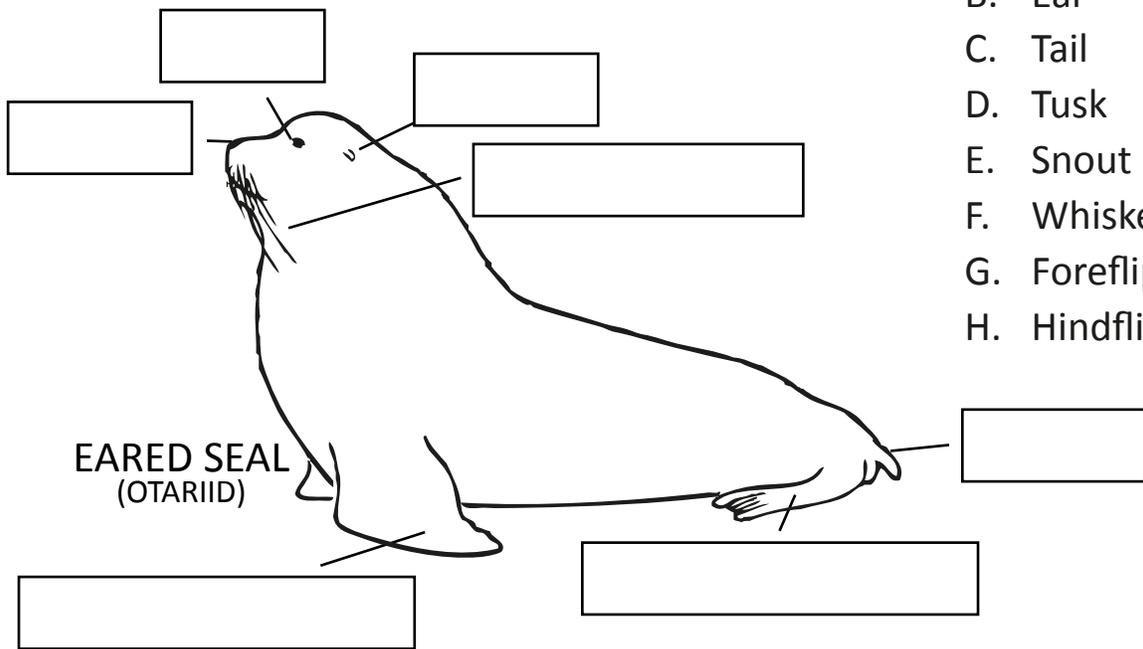
WORKSHEET 1.6.1

Label the parts of a pinniped

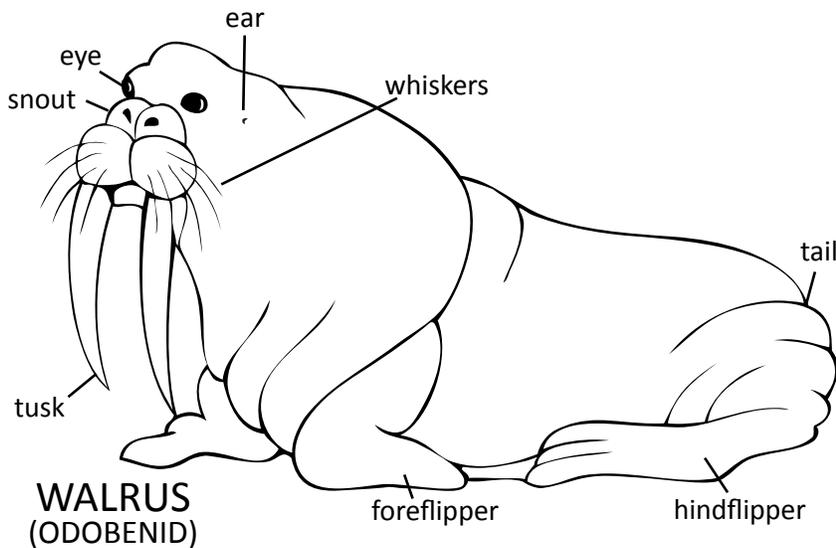
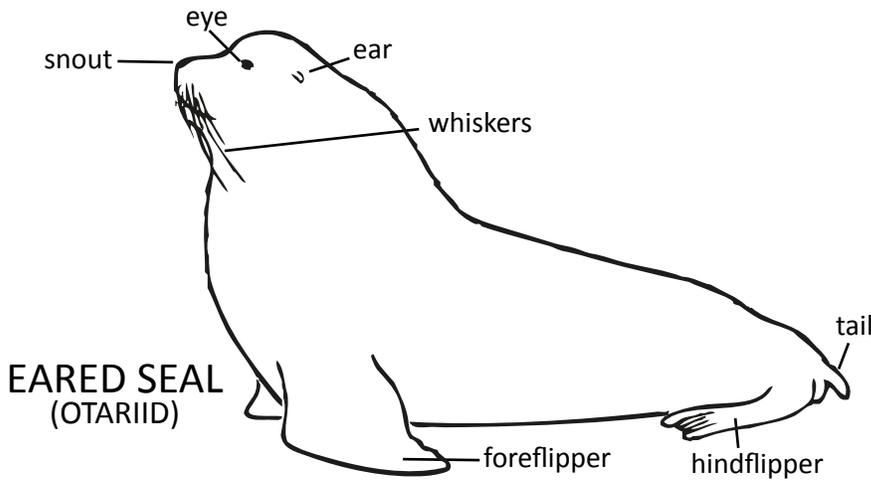
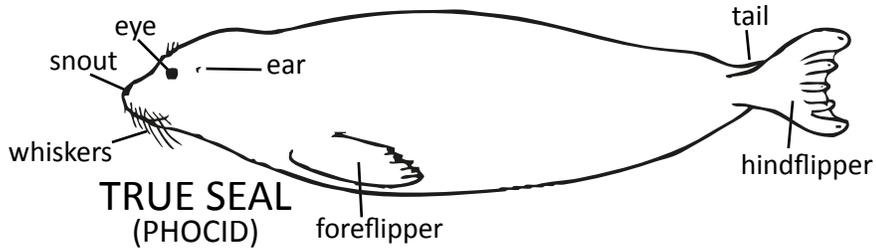
Label the parts of the three pinnipeds with the letters corresponding to the name of the body part.



- A. Eye
- B. Ear
- C. Tail
- D. Tusk
- E. Snout
- F. Whiskers
- G. Foreflipper
- H. Hindflipper



ACTIVITY 1.6 **TEACHER KEY 1.6.1** Label the parts of a pinniped



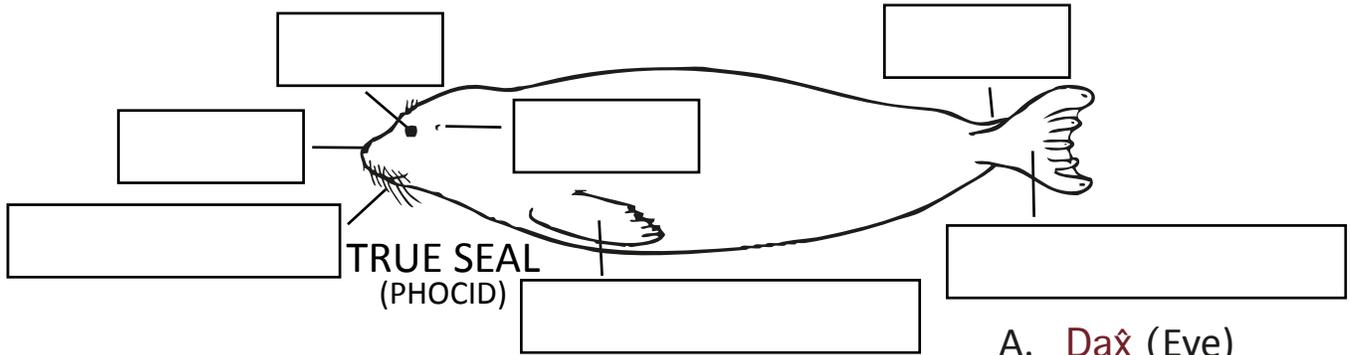
- A. Eye
- B. Ear
- C. Tail
- D. Tusk
- E. Snout
- F. Whiskers
- G. Foreflipper
- H. Hindflipper

ACTIVITY 1.6

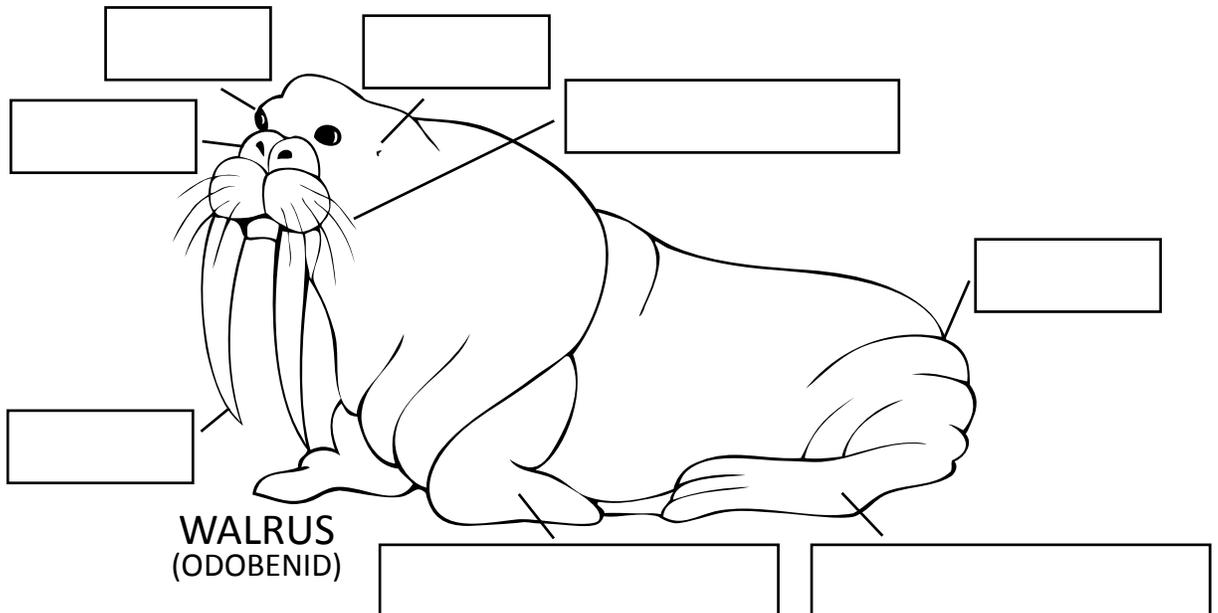
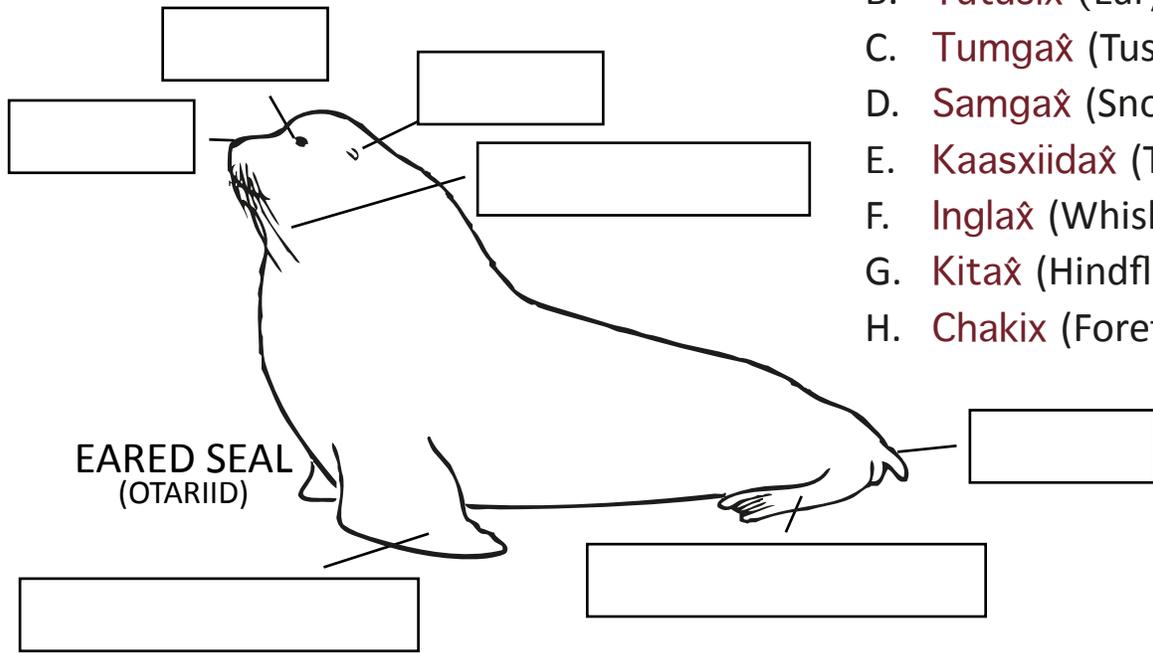
WORKSHEET 1.6.2

Label the parts of a pinniped in Unangan

Label the parts of the three pinnipeds with the letters corresponding to the name of the body part.



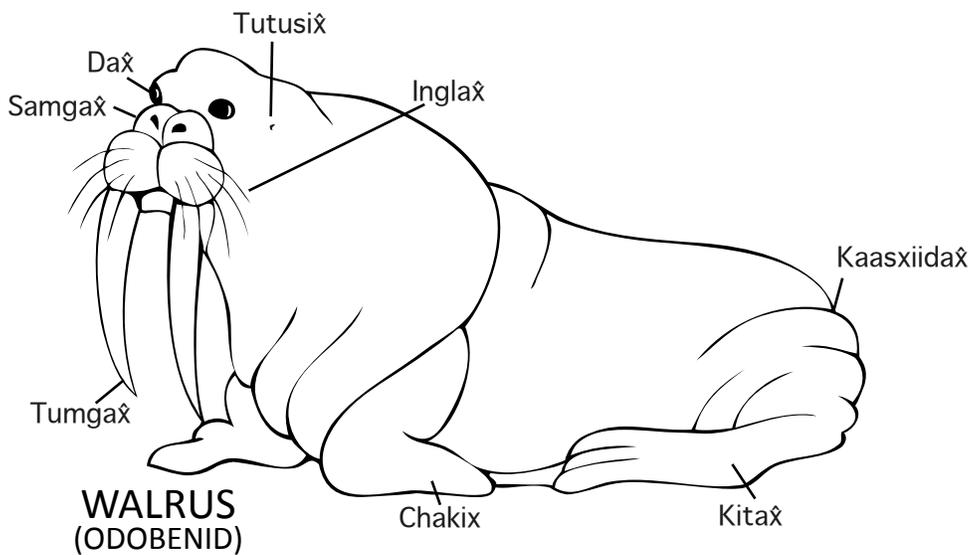
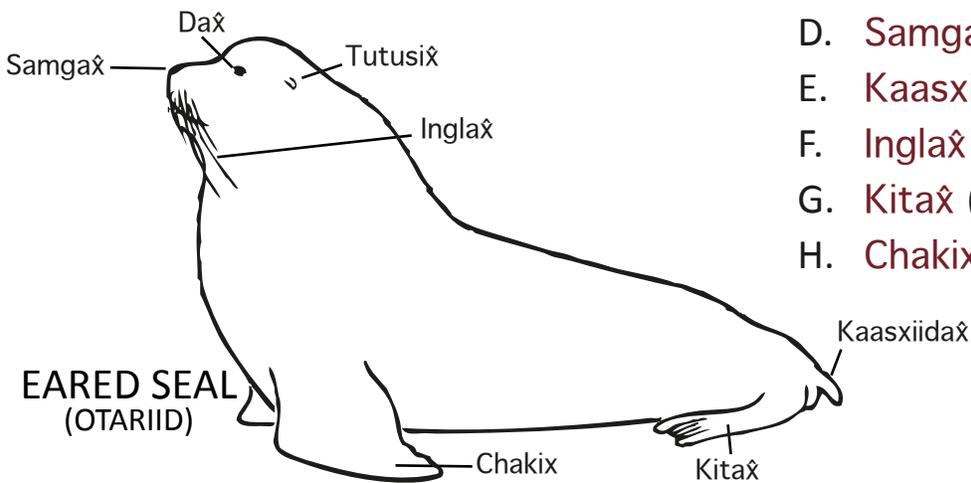
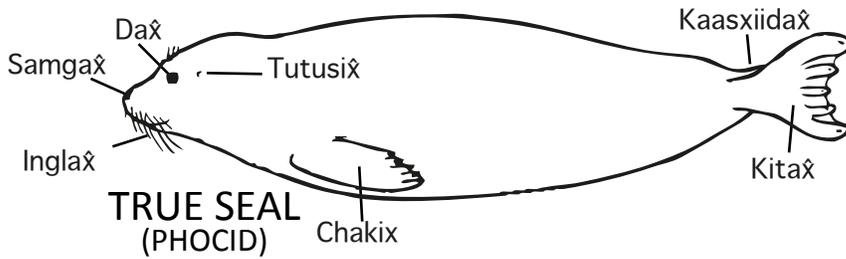
- A. Daŋ (Eye)
- B. Tutusiŋ (Ear)
- C. Tumgaŋ (Tusk)
- D. Samgaŋ (Snout)
- E. Kaasxiidaŋ (Tail)
- F. Inŋlaŋ (Whiskers)
- G. Kitaŋ (Hindflipper)
- H. Chakix (Foreflipper)



ACTIVITY 1.6

TEACHER KEY 1.6.2

Label the parts of a pinniped in Unangan



- A. Dâx (Eye)
- B. Tutusîx (Ear)
- C. Tumgâx (Tusk)
- D. Samgâx (Snout)
- E. Kaasxiidâx (Tail)
- F. Inglâx (Whiskers)
- G. Kitâx (Hindflipper)
- H. Chakix (Foreflipper)

Fur

OBJECTIVE

Students will learn the structure and uses of fur seal pelage.

TIME REQUIRED

10 minutes

BACKGROUND

Pelage is the fur, hair, or wool of a mammal. The word is often used by the fur industry and scientific community.

All marine mammals in the Bering Sea need to maintain their core body temperatures in frigid waters. Fur seals and otters use air trapped in their thick fur to keep warm; harbor seals use a thick blubber layer under their fur; humans use clothing and shivering.

Russian fur traders discovered the northern fur seal herds on the Pribilof Islands in 1786. Millions of fur seals were harvested by Russia and the United States until the commercial fur harvest ended in 1972 on St. George Island and 1984 on St. Paul Island.

Fur seals have two types of fur: guard hairs (stiff long hairs that protect the underfur) and underfur where warm air is trapped to prevent loss of body heat. Fur seals have 300,000 hairs per square inch; sea otters have 1,000,000 hairs per square inch. Humans have a total of 100,000 hairs on the entire head.

Fur seal pelage became extremely fashionable once a commercially viable process for removing the guard hairs was discovered.

Highly skilled Unangan workers were used by both the Russians and Americans to kill and skin fur seals and then remove the blubber and pack the skins for further processing off the Pribilof Islands. Both St. Paul and St. George housed a processing plant where the following steps took place:

1. Skins were soaked in sea water
2. Blubbered, to remove all blubber from hide
3. Salted, to draw moisture from the pelage
4. Packed in wooden barrels and shipped off island

Furs were processed in factories in London and St. Louis (cleaned, stretched and dried, guard hairs removed, and dyed). The final processed fur was sold at auction to the clothing industry.

MATERIALS

- Natural fur seal pelage
- Processed and dyed fur seal pelage
- Harbor seal pelage (if available)
- Sea otter pelage (if available)
- Other fur found locally (e.g. caribou, fox, wolf, rabbit, raccoon)

PROCEDURES

- Let all of the students touch, explore and handle the pelages.
 - ◆ Discuss how the animal kept warm.
 - ◆ Discuss how humans keep warm.
- If you have fur seal or sea otter pelage push the guard hairs against the grain to expose the light colored underfur.
 - ◆ Discuss the difference between the natural and processed fur.

DISCUSSION

How many layers of fur does the fur seal have?

Two – the guard hair and the underfur

What made the fur so desirable?

Once the guard hair was removed the underfur was very soft, dense, and warm.

EXPLORE AND EXTEND

If harbor seal and otter pelts are available, compare their fur to the northern fur seal fur.

- Discuss which pelage belongs to which animal
- Discuss the unique properties of each pelage and how the fur keeps the animal warm
 - Sea otters and fur seals trap air in the underfur.**
 - Harbor seals have blubber under their fur.**
- View videos from *The Pribilof Island: Preserving the Legacy* regarding blubbering: http://docs.lib.noaa.gov/noaa_documents/NOS/ORR/TM_NOS_ORR/TM_NOS-ORR_17/HTML/Pribilof_html/Pages/pribilof_video_gallery.htm

