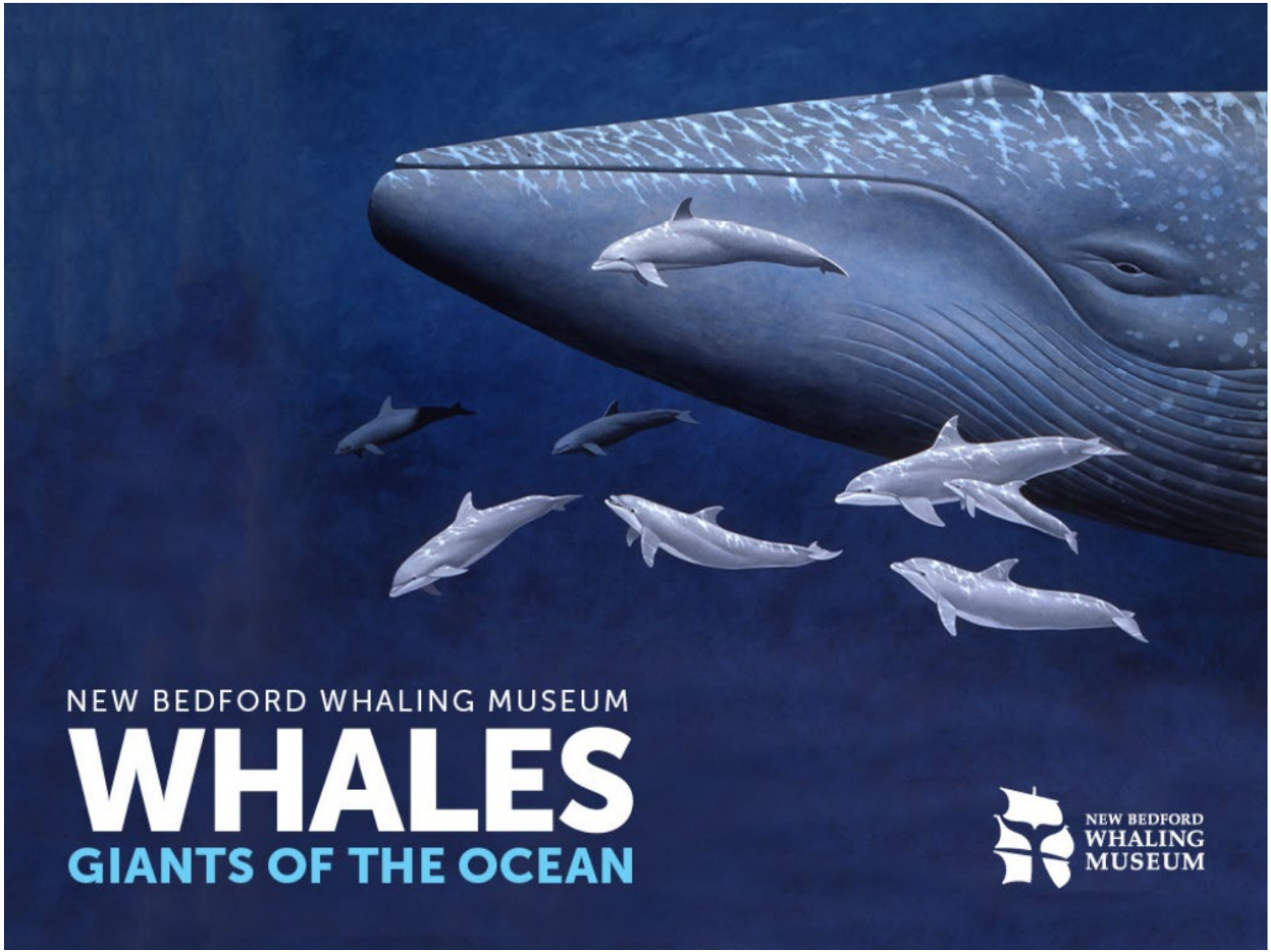


Program Summary

For teachers who host NBWM staff for the intro lesson, teach students in-person, and visit the NBWM with their students.

Whales – Giants of the Ocean

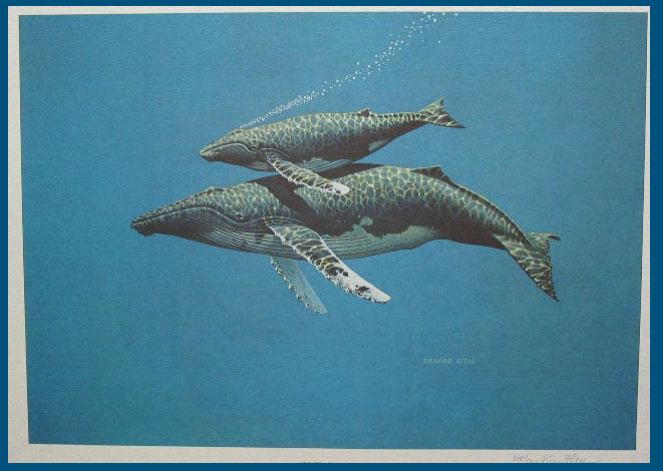
Guiding Questions

- Pre-Visit: What do you know about the oceans, about whales?
- Lesson One (visit by Museum staff): The ocean is a vast resource. How much of the earth's surface does it cover? What mammals live in the ocean?
- Lesson Two: Is it a whale or a fish? What adaptations are available for whales?
- Lesson Three: How big are whales?
- Lesson Four: What special features help an organism live in a certain environment?
- Lesson Five: How do whales and other marine mammals stay warm in the cold ocean?
- Lesson Six and Seven(at NBWM): How are the feeding habits of toothed whales and baleen whales different? What do they see if their eyes are on the side of the head? How do compression waves, made during echolocation, move? How long are food chains for the two different groups of whales?
- Lesson Eight: What information about cetaceans would you like to share? What form will this demonstration of knowledge take?

Whales – Giants of the Ocean

For Lesson 1 – led by Museum staff

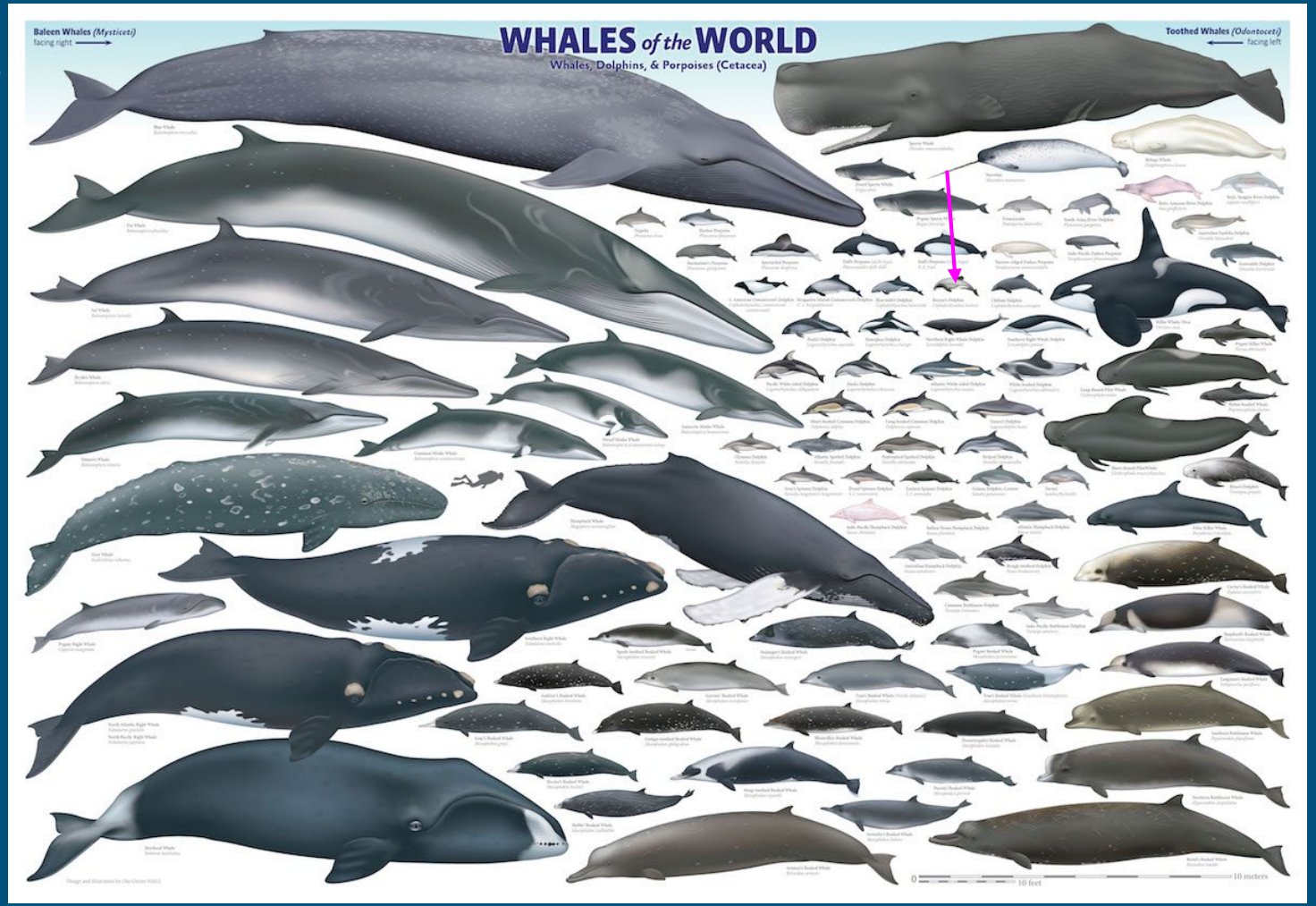
- Cetaceans are:
  - Aquatic mammals with:
    - torpedo-shaped bodies
    - horizontal tails
    - flippers for steering
    - eyes on the side of the head
    - a layer of blubber
    - multiple stomachs, because they don't chew their food



Whales – Giants of the Ocean

For Lesson 1 - led by Museum staff

- There are approx 90 species
  - Largest is the blue whale
  - Smallest is the Hector's dolphin
  - 77 have teeth (Odontocetes)
    - 35 species of dolphin
    - 22 species of beaked whale
    - 7 species of porpoise
    - 4 species of river dolphin
  - 15 have baleen (Mysticetes)

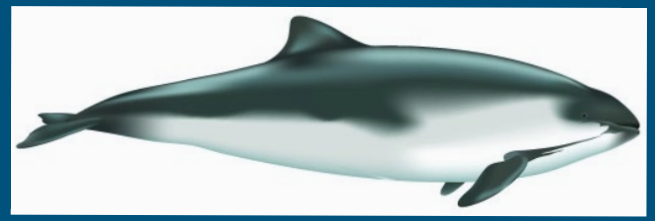


Whales – Giants of the Ocean

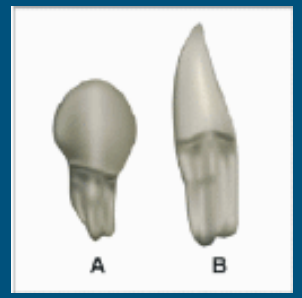
For Lesson 1 - led by Museum staff

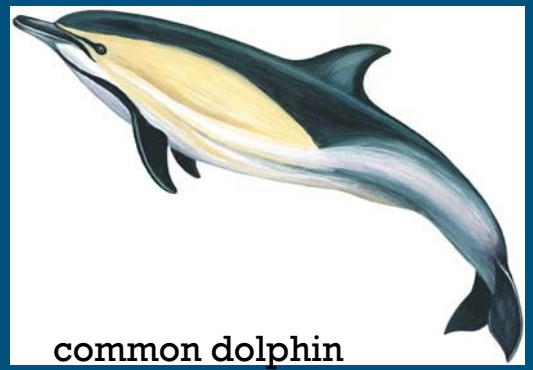
The Differences Between Dolphins and Porpoises

- Dolphins and porpoises are both smaller than baleen whales
- Dolphins have a beaked shaped snout and a curved dorsal fin
- Porpoises have a smooth rounded snout and a triangular dorsal fin
- Their teeth are shaped differently
- Dolphins are more likely to travel in large groups called pods



harbor porpoise





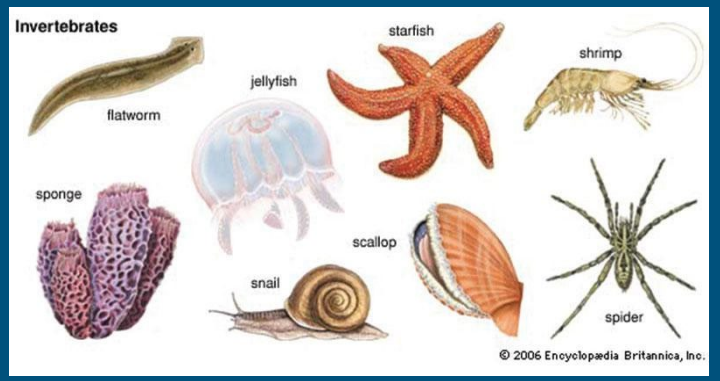
common dolphin

Illustrations by Uko Gorter. Used with permission.

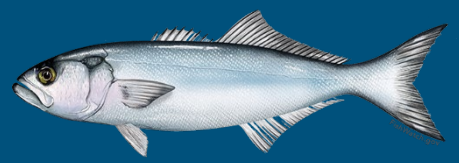
Whales – Giants of the Ocean

For Lesson 2 - led by Museum staff

Classification



- Vertebrates are animals with a spine.
- Invertebrates are animals that do not have a spine.
- The five groups of vertebrates are:
  - Amphibians – fresh water animals, juveniles have gills, adults have lungs and legs, soft shelled eggs
  - Birds – have feathers, wings, beaks, hollow bones, hard-shelled eggs
  - Fishes – have scales, gills, vertical tails
  - Mammals – have hair or fur, live birth, nurse their young
  - Reptiles – have dry scaly skin, cold-blooded, hard-shelled eggs

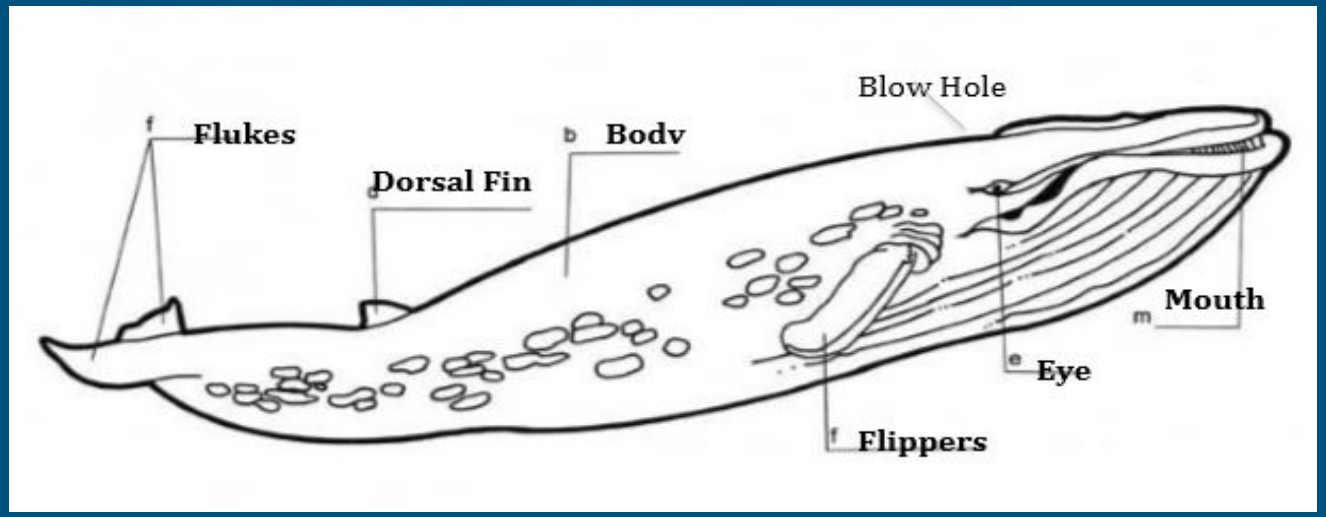


Whales – Giants of the Ocean

For Lesson 3

Fish vs. Whale

- Whales:
  - warm blooded
  - live birth
  - provide milk for young
  - move tail up and down
  - breathe air with lungs
  - blowholes connect to lungs
  - have smooth skin sometimes covered with hair

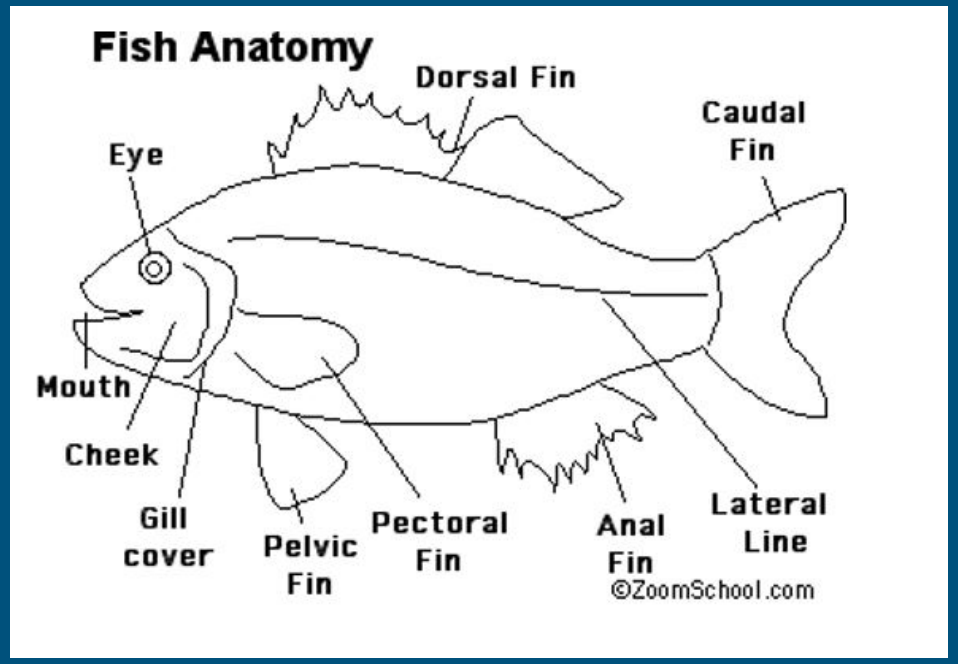


Whales – Giants of the Ocean

For Lesson 3

Fish vs. Whale

- Fishes:
  - cold blooded
  - lay eggs
  - do not care for their young
  - move tails side to side
  - use gills to get oxygen
  - have scaly skin

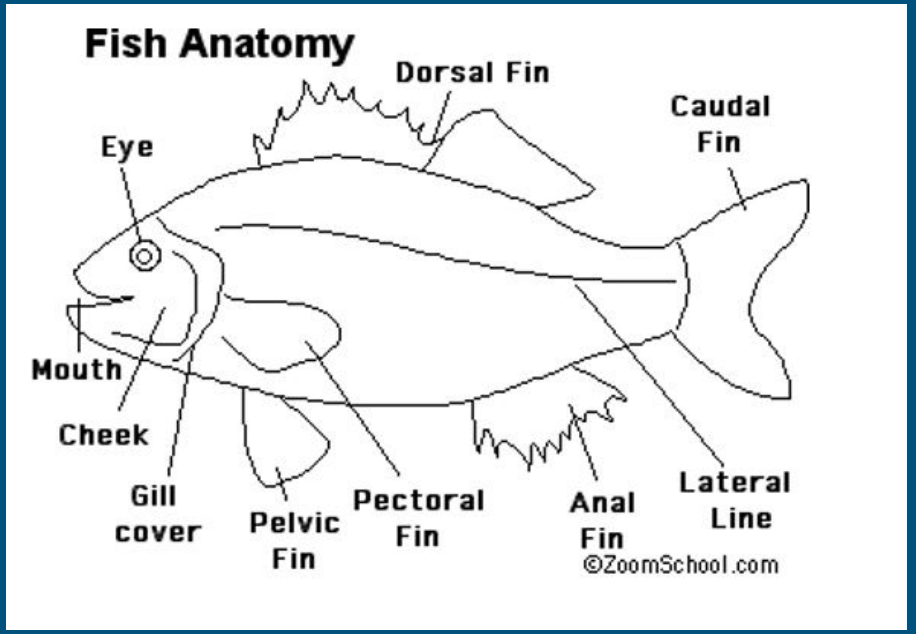


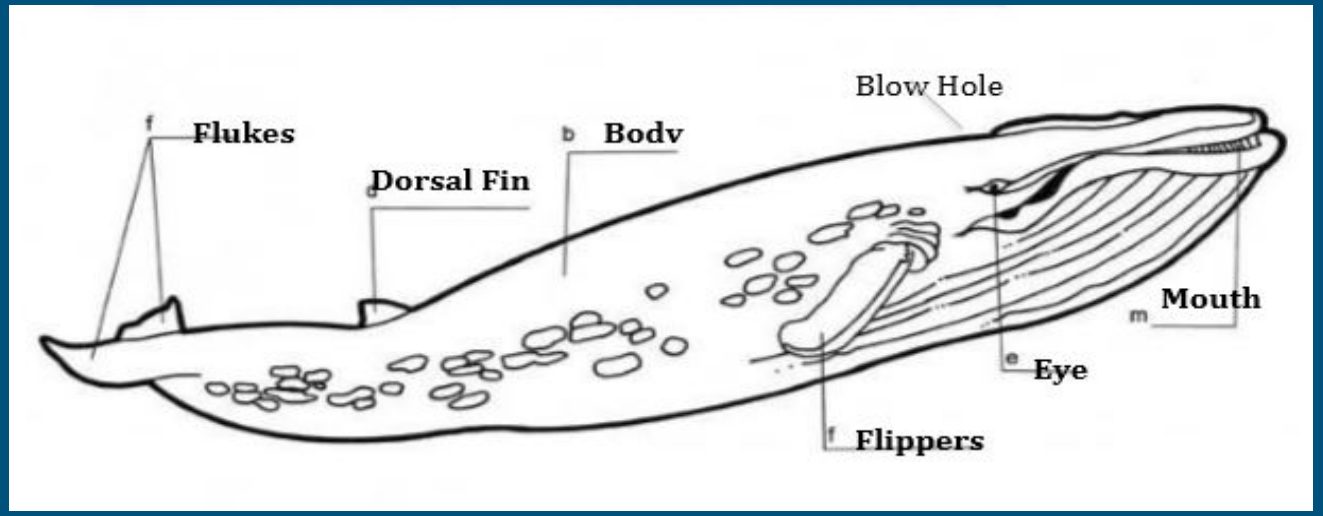
Whales – Giants of the Ocean

For Lesson 3

Fish vs Whale

- Fishes and whales:
  - swim in the water
  - have backbones
  - have a heart
  - have a brain
  - have fins





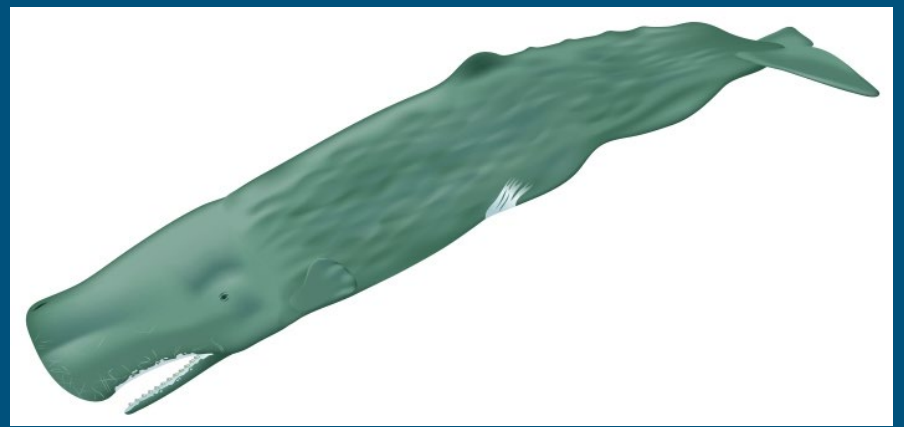
NEW BEDFORD WHALING MUSEUM

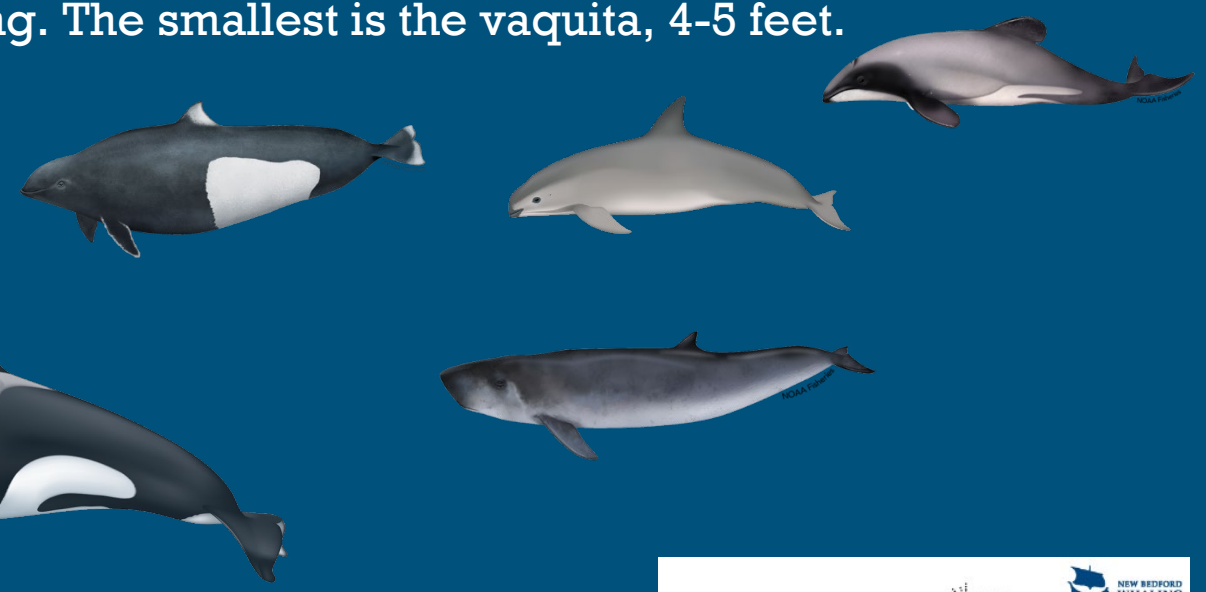
Whales – Giants of the Ocean

For Lesson 4

Just How Big Are Whales?

- Whales, dolphins and porpoises range in length from 100 feet to 5 feet.
- The biggest whale ever was a blue whale that was 109 feet long.
- The biggest whale with teeth is the sperm whale. Males can be longer than 70 feet.
- The smallest whale is the dwarf sperm whale, 7-8 feet long.
- The biggest dolphin is the orca, males reach 32 feet long. Smallest is the Hector's dolphin, 4 1/2-5 feet long.
- The biggest porpoise is the Dall's porpoise, 7 ½ feet long. The smallest is the vaquita, 4-5 feet.



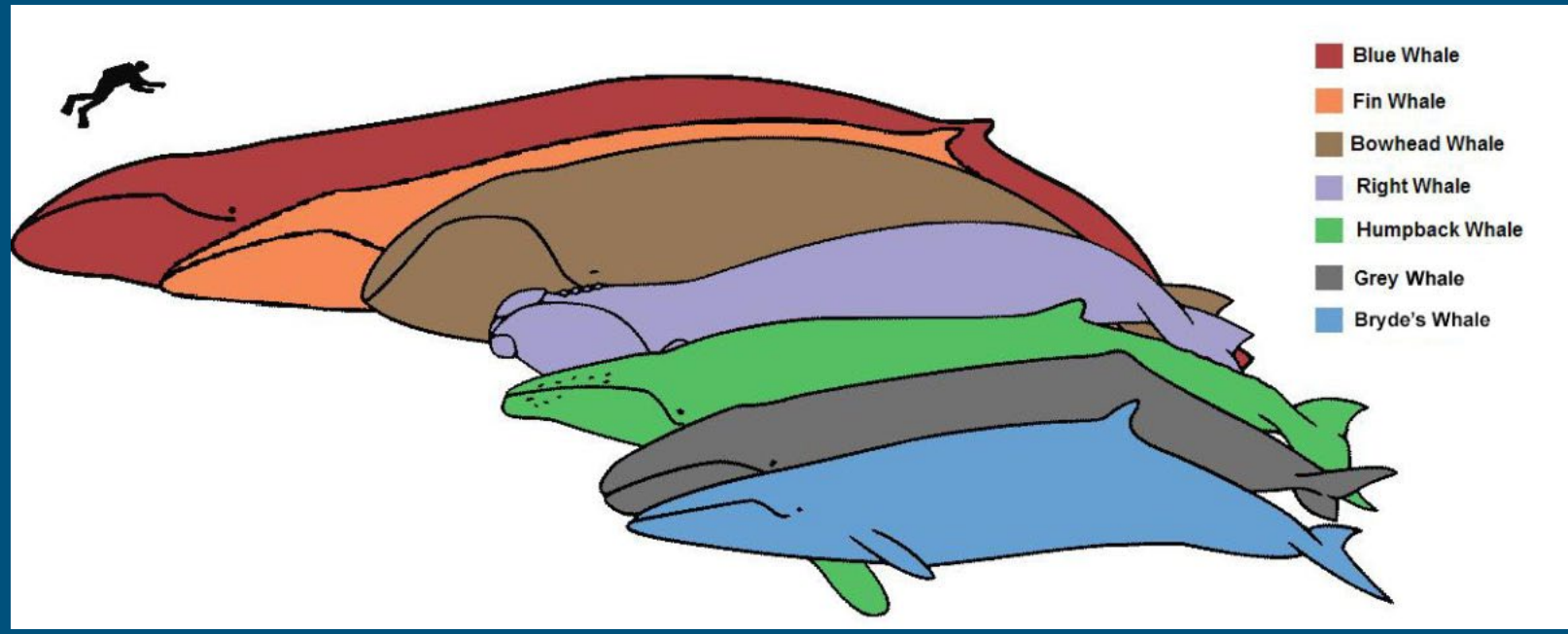


Whales – Giants of the Ocean

For Lesson 4

Just How Big Are Whales?

- Blue whale – 100 feet
- Fin whale – 80 feet
- Bowhead whale – 60 feet
- Right whale – 50-60 feet
- Humpback whale – 50 feet
- Gray whale – 40 feet
- Bryde's whale – 35 feet
- Sperm whale – 55 feet
- Minke whales and orca – 30 feet
- Pilot whale – 20 feet



Whales – Giants of the Ocean

For Lesson 4

Just How Big Are Whales?

Additional species and lengths

Cetacean (whale, dolphin or porpoise)	**Average Length (in feet)**	**Number of students lying head to toe that would equal the length of this whale**	**Number of other objects that would equal the length of this whale**
Beluga	15 feet		
Blue Whale - calf	25 feet		
Bowhead	55 feet		
Common Dolphin	6 feet		
Cuvier's Beaked Whale	20 feet		
Gray Whale	45 feet		
Harbor Porpoise	5 feet		
Right Whale - calf	12 feet		
Risso's Dolphin	10 feet		

Whales – Giants of the Ocean

For Lesson 4

Just How Big Are Whales?

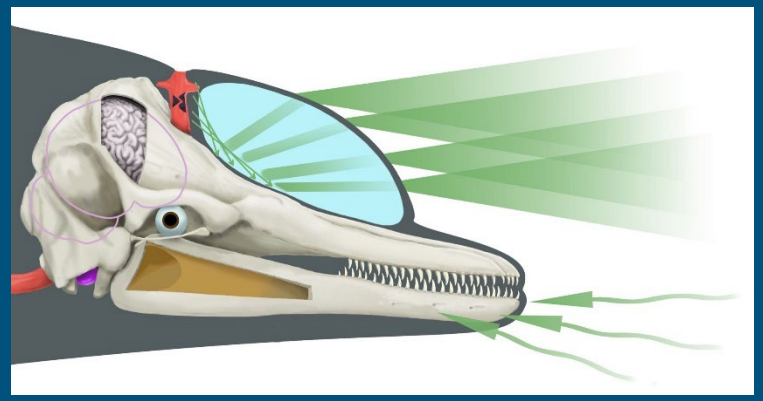
- Students – try to predict how many of you lying head to toe it would take to equal the length of different whale species.
- Students – try to compare the length of different objects to different whale species.
- How does the length of a blue whale compare with your height?
- If a school bus is approximately 30 feet long, how many school buses would it take to equal the length of one blue whale?

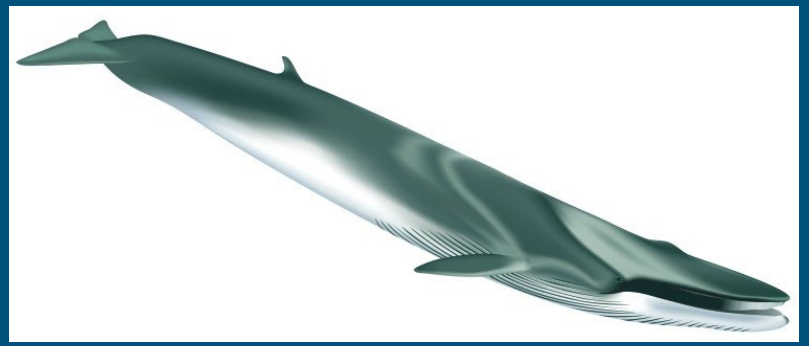
Whales – Giants of the Ocean

For Lesson 5

Critter Creation

- Why do animals have different features?
- Why do some organisms have big teeth, or long legs, or a lot of fur?
- These features, or adaptations, help these creatures survive in their habitat. Some make it easier to find food; others make hiding easier; others help the animal survive in extreme temperatures.
- For example, thick blubber helps the bowhead whale survive the extreme cold of the Arctic Ocean.
- Echolocation makes it possible to find food in the dark depths of the ocean.
- Streamlined, torpedo-shaped bodies conserves energy by making it easier for cetaceans to slice through the water easily.



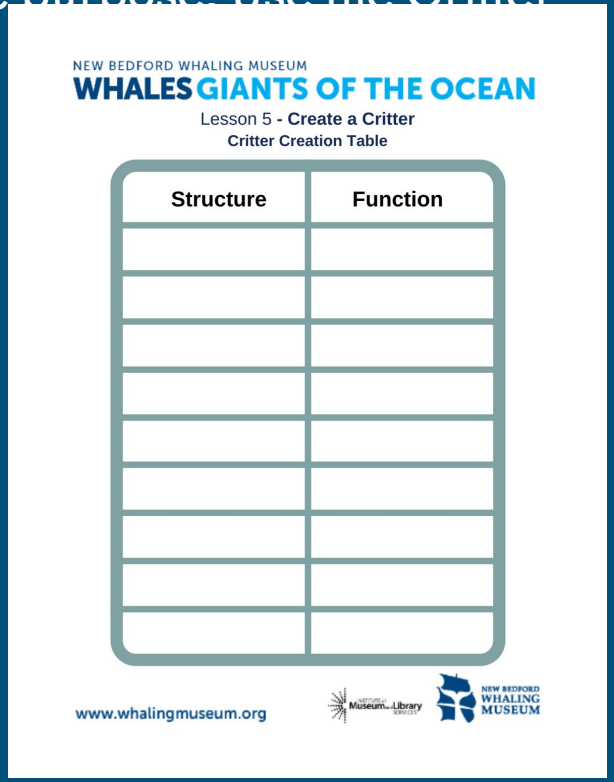


Whales – Giants of the Ocean

For Lesson 5

Critter Creation

- You will design an imaginary critter that lives in a climate of your choice.
- It must have features or adaptations that have a specific purpose. Use the Critter Creation Table to list the feature and the purpose.
- Some things to consider:
  - How does it stay warm or cool? (fur, scales, shell, etc.)
  - How does it get food? (claws, fly, fast runner, etc.)
  - How does it survive the wetness or dryness?
  - Does it need to shed water or snow? (shape, rubbery skin, etc.)
  - Does it need to conserve water? (scales, thick skin, etc.)
  - What is it covered with? (scales, waxy coating, feathers, etc.)
- Draw your critter big enough to fill a sheet of paper.


NEW BEDFORD WHALING MUSEUM
WHALES GIANTS OF THE OCEAN
Lesson 5 - **Create a Critter**
Critter Creation Table

Structure	Function

www.whalingmuseum.org

Whales – Giants of the Ocean

For Lesson 5

Critter Creation – Reflection

- What type of place would your imaginary critter be best suited to live? (Hot or wet climate? Mountain area?)
- Explain what features would allow your critter to survive the conditions in that place or in that particular climate.
- What special features would animals need to have if they lived in the ocean? List at least 3 features and say how each feature helps it live in the ocean.

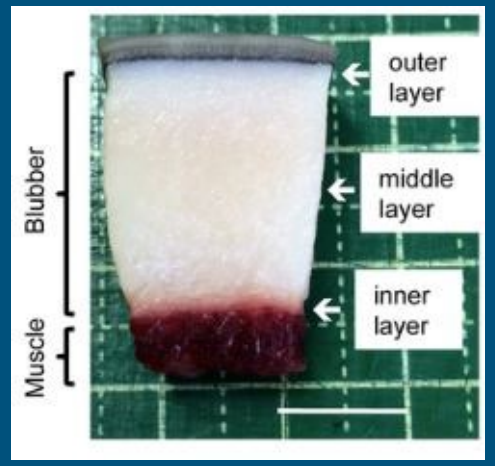
Examples from Taylor Elementary - Grade 4

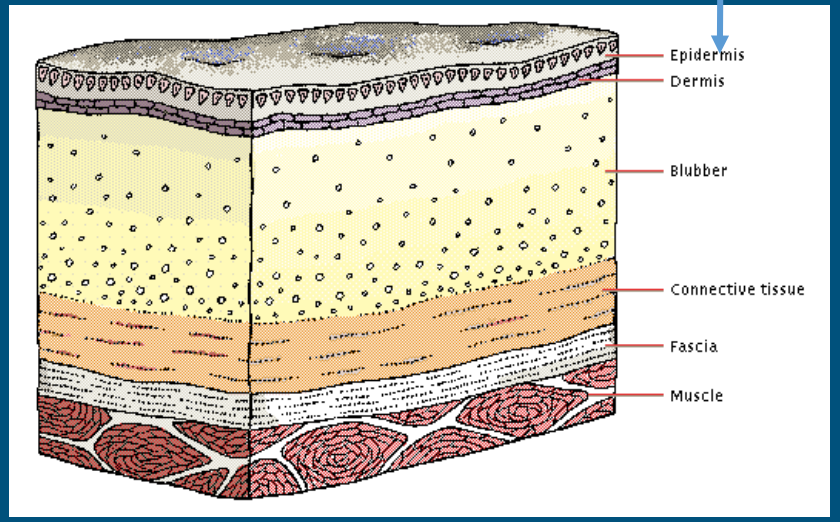
Whales – Giants of the Ocean

For Lesson 6

Blubber

- Blubber is a thick layer of fatty tissue found directly under the skin of all cetaceans. (epidermis = skin)
- Blubber stores energy, insulates heat, and increases buoyancy (the ability to float).
- Blubber is different than other forms of fat. It is thicker and has more blood vessels than typical land animal fat.
- Cetaceans near the equator have thinner blubber than those in polar circles.
- Thinnest blubber is 1 inch thick; thickest is 18 inches thick





Whales – Giants of the Ocean

For Your Visit to the New Bedford Whaling Museum

- Your visit will include a thirty minute stop in the theater for a video and a whale sounds activity, and stops at six different stations throughout the Museum.
- Be prepared to participate at each of the stops. There will be hands-on opportunities at each one.
- You will learn about how cetaceans eat, what a sound wave looks like, how echolocation works, how small we are as compared to whales, what gets eaten in different marine food chains, how heavy a sperm whale tooth is and other fun cetacean information.
- As with all museums, walking is the safest way to move from station to station. So, please don't run.
- If you visit in colder weather, coats will go in the coat room.
- If you stay for lunch, please put your food and drink in the rolling bin. We will make sure it gets to the Harbor View Gallery, which is where you will eat lunch.