

# ALL ABOUT DOLPHINS



A group of dolphins is shown leaping from the water in a blue-toned photograph. The dolphins are captured in mid-air, creating white splashes as they exit the water. The background is a deep blue, textured surface of the ocean.

HOW MANY SPECIES OF DOLPHINS  
DO YOU THINK THERE ARE?

TAKE A GUESS!

Remember: The number of any species of animals  
can always change if new species are discovered!

# THE LARGEST DOLPHIN



# THE SMALLEST DOLPHIN



# THE MEASUREMENTS

Orca/Killer whales:

20-26 feet or 6-8 meters

Up to 6 tons or 5443 kilograms

Maui's Dolphins

4-6 feet or 1.2-1.8 meters

95-115 pounds or 43-52 kilograms

# HERE ARE JUST A FEW OF THE 44 SPECIES OF DOLPHINS



Risso's Dolphin

PG: Tracie Sugo



Common Dolphin



Pink River Dolphin

# ARE DOLPHINS FISH OR MAMMALS?

What do you think?

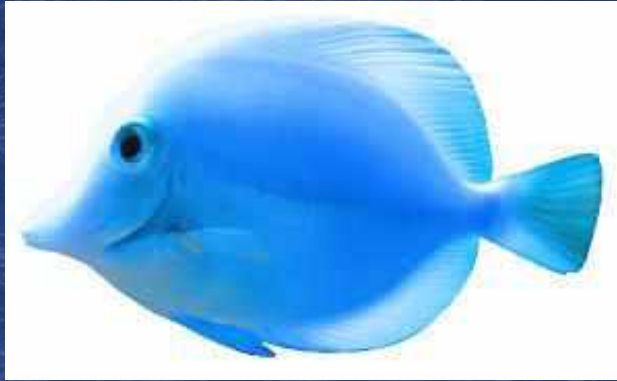
What are some reasons that you think dolphins are classified as fish or mammals?





# WHAT ARE SOME CHARACTERISTICS OF ALL MAMMALS?

What makes mammals different from  
fish, amphibians, reptiles and birds?



# SOME CHARACTERISTICS OF MAMMALS

- VIVIPAROUS, mammals give birth to LIVE young - they don't lay eggs!
- NURSE THEIR YOUNG WITH MILK, all mammals provide their young with highly nutritious milk as they are growing
- WARM-BLOODED, mammals are able to generate their heat internally to maintain homeostasis - keeping a stable internal environment
- LUNGS TO BREATHE AIR, all mammals breathe air by bringing air into their lungs and extracting oxygen from that air
- FOUR-CHAMBERED HEART, all mammals have a four-chambered heart that allows for efficient circulation by separating oxygenated and non-oxygenated blood

# ANOTHER CHARACTERISTIC OF MAMMALS

Mammals have  
HAIR!

Hair provides a  
way to maintain  
heat and stay  
warm.



# DOLPHINS ARE MAMMALS!

- Dolphins give birth to LIVE young, they do NOT lay eggs.
- Dolphins nurse their young with milk from the female's mammary glands
- Dolphins are warm-blooded
- Dolphins have lungs to breathe air
- Dolphins are all vertebrates
- Dolphins have hair on their upper jaw at birth but it drops off about 2 weeks after birth

# WHY DO YOU THINK A DOLPHIN'S HAIR DROPS OFF SHORTLY AFTER BIRTH?

Hint: What is the function of hair/fur for mammals?

What do dolphins have for this function that other mammals do not?

Some dolphins such as belugas and narwhals live in the coldest areas on Earth, if they don't have hair/fur, how do they stay warm?


# DOLPHINS HAVE BLUBBER!

Blubber is a thick layer of fat tissue

Fat tissue acts as an insulator

An insulator keeps heat in - houses have insulation in the walls to help keep heat inside the house

Having blubber allowed dolphins to evolve to be hairless as adults - why do you think dolphins might be at a disadvantage if they did have hair/fur for insulation?



Dolphins live in an aquatic world and rely on being fast swimmers both to **CATCH** their prey and to **AVOID** being caught by predators

- Hair adds additional drag when moving through the water
- Drag is a type of resistance that slows down a moving object
- Competitive human swimmers often shave the hair off their entire bodies to reduce drag
- Not having hair allows dolphins to swim **FASTER!**

Swimming dolphins: can you imagine how hair would slow them down? (Video)





# IF HAVING HAIR IS A DISADVANTAGE FOR DOLPHINS, WHY DO THEY HAVE IT AT ALL?

- Why do YOU think dolphins have hair when they are born, only to have it drop off at about two weeks after their birth.
- Why aren't dolphins just born hairless?

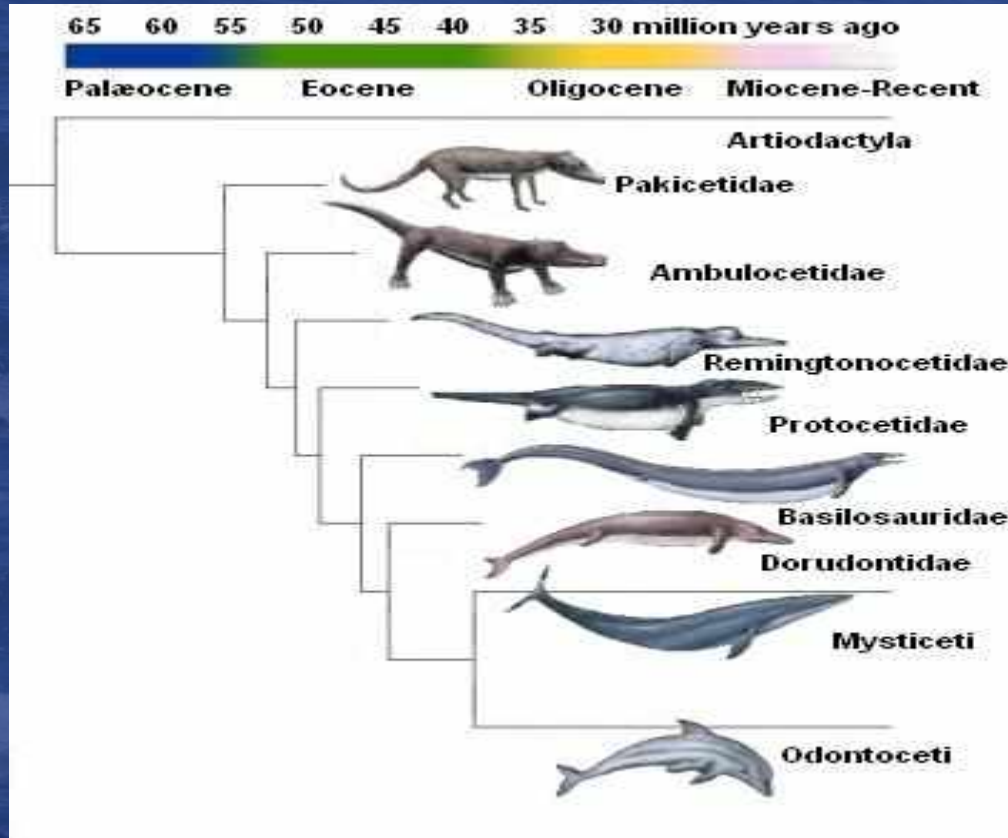
# The ontogeny of a species can give us clues to its evolutionary history

- Ontogeny = the development of an organism from inception to maturity; how an organism develops from the moment it is conceived until it is a mature adult
- Phylogeny = the history of the evolution of a species or group
- HOW MIGHT THIS APPLY TO DOLPHINS?
- Think about the fact that dolphins have hair when they are born
- What type of animal do you think dolphins evolved from? Fish or Mammal? Why?

# WHAT DO YOU THINK THE ANCESTORS OF MODERN DOLPHINS LOOKED LIKE?

- Scientists believe that dolphins evolved from land mammals that returned to the sea
- Their ancestors are believed to have been similar to small deer
- Those land animals would have had hair/fur
- Fossil evidence documents the transition from land to water
- Dolphins closest living relatives are thought to be hippos
- What other changes in dolphin anatomy have allowed dolphins to adapt to a completely aquatic life?

# DOLPHIN PHYLOGENY



# HOW DO DOLPHINS BREATHE?

Dolphins don't have gills like fish do to extract oxygen from water.

Remember, dolphins are MAMMALS and use lungs to breathe in air.

Oxygen is then taken from that air and enters the bloodstream where it is distributed throughout the body.

Dolphins have LUNGS and extract oxygen from the air that they breathe in.

WHERE IS A DOLPHIN'S NOSE?

DOLPHIN BLOWING AIR OUT OF ITS “NOSE”!



# A DOLPHIN'S NOSE IS IT'S BLOWHOLE!

- Have you ever seen a dolphin breathing? It surfaces, opens its blowhole, expels air that can be seen as water vapor and takes in a new breath.
- The blowhole has migrated over millions of years of evolution to the top of the head, making it easy to breathe at the surface of the water.
- The blowhole has muscles which the dolphin controls. It must learn to time it just right so that the blowhole is open above the water and closes before going back underwater.
- Newly born dolphin calves can be seen learning to get their swimming and breathing pattern just right.

# DOLPHIN BREATH



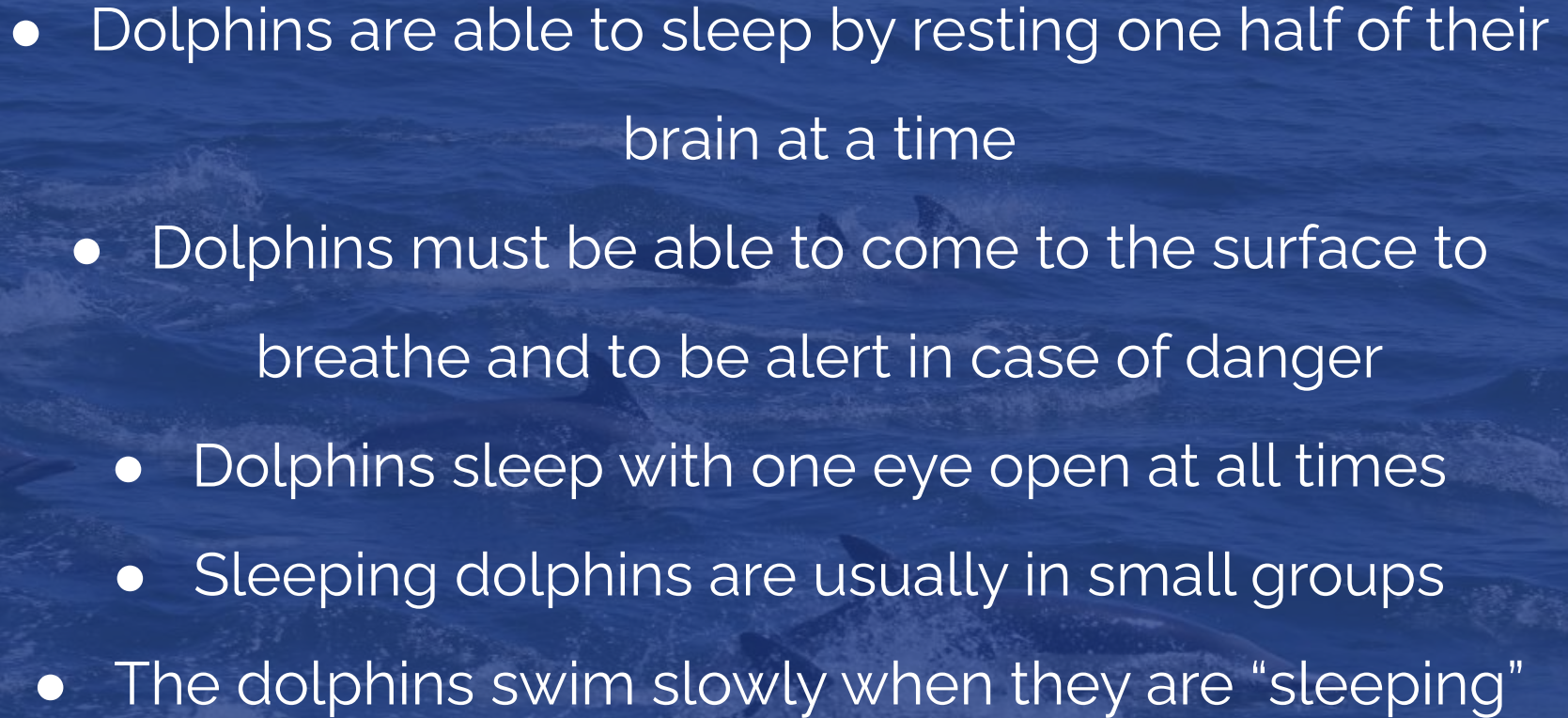


# How do dolphins sleep?

- Dolphins are conscious breathers, meaning they have to think about breathing
- They must open their blowhole when at the surface and close it before diving back underwater

IF THEY HAVE TO THINK ABOUT BREATHING,  
HOW CAN THEY EVER SLEEP?

ANY IDEAS?

- 
- Dolphins are able to sleep by resting one half of their brain at a time
  - Dolphins must be able to come to the surface to breathe and to be alert in case of danger
    - Dolphins sleep with one eye open at all times
    - Sleeping dolphins are usually in small groups
  - The dolphins swim slowly when they are “sleeping”

# Sleeping Dolphins



# WHAT SEPARATES BALEEN WHALES FROM DOLPHINS?

- Baleen whales are the large whales such as humpback whales, blue whales and others.
- How are dolphins different from these whales?
- What structures do dolphins have that these whales do not?
- What behaviors are different between baleen whales and dolphins?
- What are the social groups for baleen whales and dolphins?

# INSIDE A HUMPBACK WHALE'S MOUTH



# INSIDE A BOTTLENOSE DOLPHIN'S MOUTH



# BALEEN WHALES HAVE A DOUBLE BLOWHOLE



DOLPHINS HAVE A SINGLE BLOWHOLE





# ALL DOLPHINS ARE WHALES BUT NOT ALL WHALES ARE DOLPHINS

- Dolphins are toothed whales. They have teeth and baleen whales do not. Baleen whales have baleen which are large bristle-like structures used in feeding.
- Dolphins have teeth although they use their teeth differently than we do. Dolphins use their teeth to grasp and immobilize fish and other prey. They swallow their prey whole. They do not chew their food like we do.
- Dolphins tend to live in social groups called “pods” while baleen whales are usually solitary animals, sometimes coming together to feed or breed.

# DOLPHIN SOCIAL GROUP = POD

## COMMON DOLPHIN POD IN MONTEREY, CA (VIDEO)



# SOME SPECIES TRAVEL IN SMALLER PODS (VIDEO)



# DOLPHIN PODS: GROUPS OF DOLPHINS

Pod structures include:

- NURSERY PODS: groups of mothers with calves, sometimes accompanied by a few males, and also with elders whom they protect
- JUVENILE PODS: groups of young adults
- MALE PODS: usually small groups of males that travel together and work cooperatively

# WHY DO DOLPHINS FORM PODS?

- The larger, baleen whales are usually solitary animals that come together to feed and mate while dolphins live in pods.
- What advantages do you think there are for dolphins to form pods? How does being in a group help the dolphins?

# ADVANTAGES TO LIFE IN A POD

- Cooperative hunting: working together leads to more successful hunts
- Mating: some dolphins mate within their pod but never with relatives, this occurs in species with large pods; in smaller pods, males will leave the pod to mate and then return to their family pod
- Protection: dolphins are smaller than the baleen whales, there is safety in numbers

# BIGGEST ADVANTAGE IS SOCIALIZATION

- Dolphins play together
- Dolphins teach their offspring their pod's culture including hunting methods and more
- Many species “alloparent” which means taking care of a calf that is not your own, like baby-sitting
- Dolphins have exhibited empathy, cooperation and altruism



Empathy is the ability to sense others emotions

- Dolphins have been observed grieving over the loss of calf, not just the mother but all pod members

Cooperation is working together for the same end

- Dolphins often work together when hunting

Altruism is selfless concern for others

- Dolphins have been observed helping both their own species and other species with no benefit for the dolphins



# PILOT WHALE POD GRIEVES FOR DEAD CALF EMPATHY (VIDEO)



# DOLPHIN COOPERATION (VIDEO)



# DOLPHIN ALTRUISM (VIDEO)



# DOLPHIN BEHAVIORS THAT MAY INDICATE INTELLIGENCE

- Dolphins are able to communicate with each other by using a series of clicks, whistles and squeaks. They often work cooperatively when hunting.
- Dolphins are creative and playful. Dolphins have been observed surfing in waves and creating rings of bubbles as well as other creative play.
- Dolphins pass learning to their offspring. Young dolphins learn how to hunt as well as other behaviors from their mothers and other podmates.
- Dolphins show emotions, they display sadness and joy.
- There are several populations of dolphins that have been observed using tools.

# SIGNATURE WHISTLES

A blue-toned photograph of several dolphins leaping from the water, creating white splashes. The dolphins are captured in mid-air, with their bodies arched and tails visible. The background is a deep blue, suggesting the ocean's surface.

- Shortly after birth, a dolphin will create its own, personal “signature whistle” which is a unique pattern of clicks and whistles that identify it, similar to our “names.”
- Dolphins identify themselves and others by using these signature whistles.
- Recent studies show that a dolphin can remember other dolphins' signature whistles for up to 20 years!

# SIGNATURE WHISTLES (VIDEO)



**Credit: Vincent M. Janik / University of St. Andrews**

# TOOL USE BY DOLPHINS (VIDEO)



# DANGERS TO DOLPHINS

A group of dolphins is shown leaping from the water in a blue-tinted photograph. The dolphins are captured in mid-air, creating white splashes as they exit the water. The background is a deep blue, suggesting the open ocean.

What do you think a dolphin's NATURAL predators are? (two)

Hint: What is the largest dolphin?



# SHARKS FEED ON SMALLER DOLPHINS



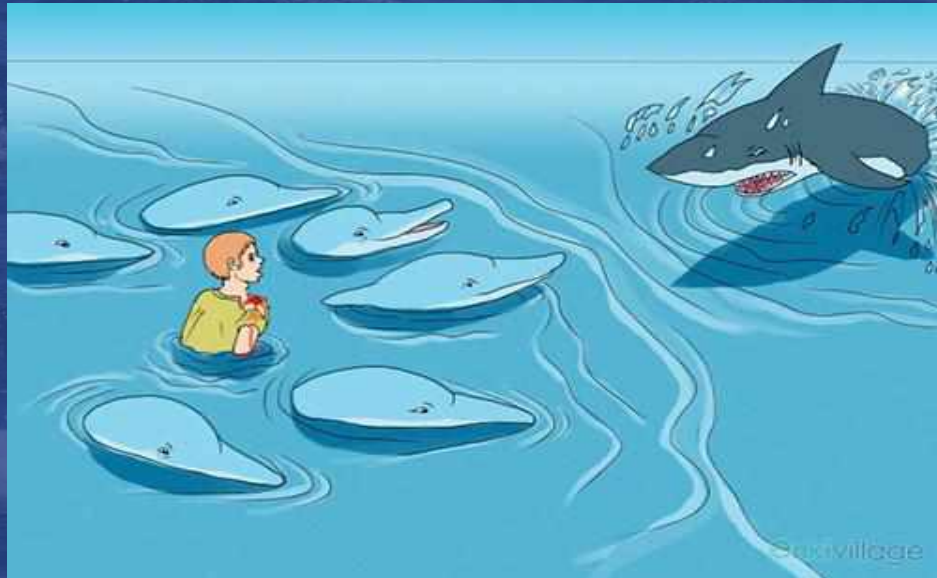
# ORCAS/KILLER WHALES FEED ON DOLPHINS OF ALL SIZES



# HOW DO DOLPHINS INTERACT WITH HUMANS IN THE OCEAN?

How do you think that dolphins interact with humans in the ocean?

Do you think they are scared of us? Friendly? Cooperate with us? Help us?



# DOLPHINS HELPING HUMANS (VIDEO)



# DOLPHINS PROTECT DIVER FROM SHARK (VIDEO)



(c) Hardy Jones Productions 2003

# DOLPHIN LIFE

- Dolphins live in family groups with very tight bonds. They socialize, play, and hunt together. Dolphins can travel 40 miles per day and the larger dolphins, orcas can travel 100 miles a day.
- What do you think life is like for a dolphin that is kept in captivity? Do you think that humans are a danger to dolphins? Why or why not?

# RESOURCES AND CREDITS

## PHOTOS:

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# Video Credits:

“Sleeping Dolphins from Disney’s ‘Dolphin Reef’

<https://www.youtube.com/watch?v=ZLZOnqxa99c>

“Dolphins Create Sponge Armor” <https://www.youtube.com/watch?v=-zdzROgOELM>

“Pilot Whales Grieve Dead Calf”

<https://www.youtube.com/watch?v=0a8HGJid-Jo&frags=pl%2Cwn>

“Dolphins Help Fishermen”

<https://www.youtube.com/watch?v=-THGIPMkM3s&frags=pl%2Cwn>

“Dolphins Help Lost Baby Seal”

[https://www.youtube.com/watch?time\\_continue=12&v=fB3FT3t6\\_sE&feature=emb\\_title](https://www.youtube.com/watch?time_continue=12&v=fB3FT3t6_sE&feature=emb_title)

"How Dolphins Respond to 'Name' Whistles"

<https://www.youtube.com/watch?v=zAjHtYh5Amo>

"Dolphins Protect Diver from Shark"

<https://www.youtube.com/watch?v=T3pXhU5vzas&frags=pl%2Cwn>

"Dolphins Work Together to Catch Fish"

<https://www.youtube.com/watch?v=-THGIPMkM3s&frags=pl%2Cwn>

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