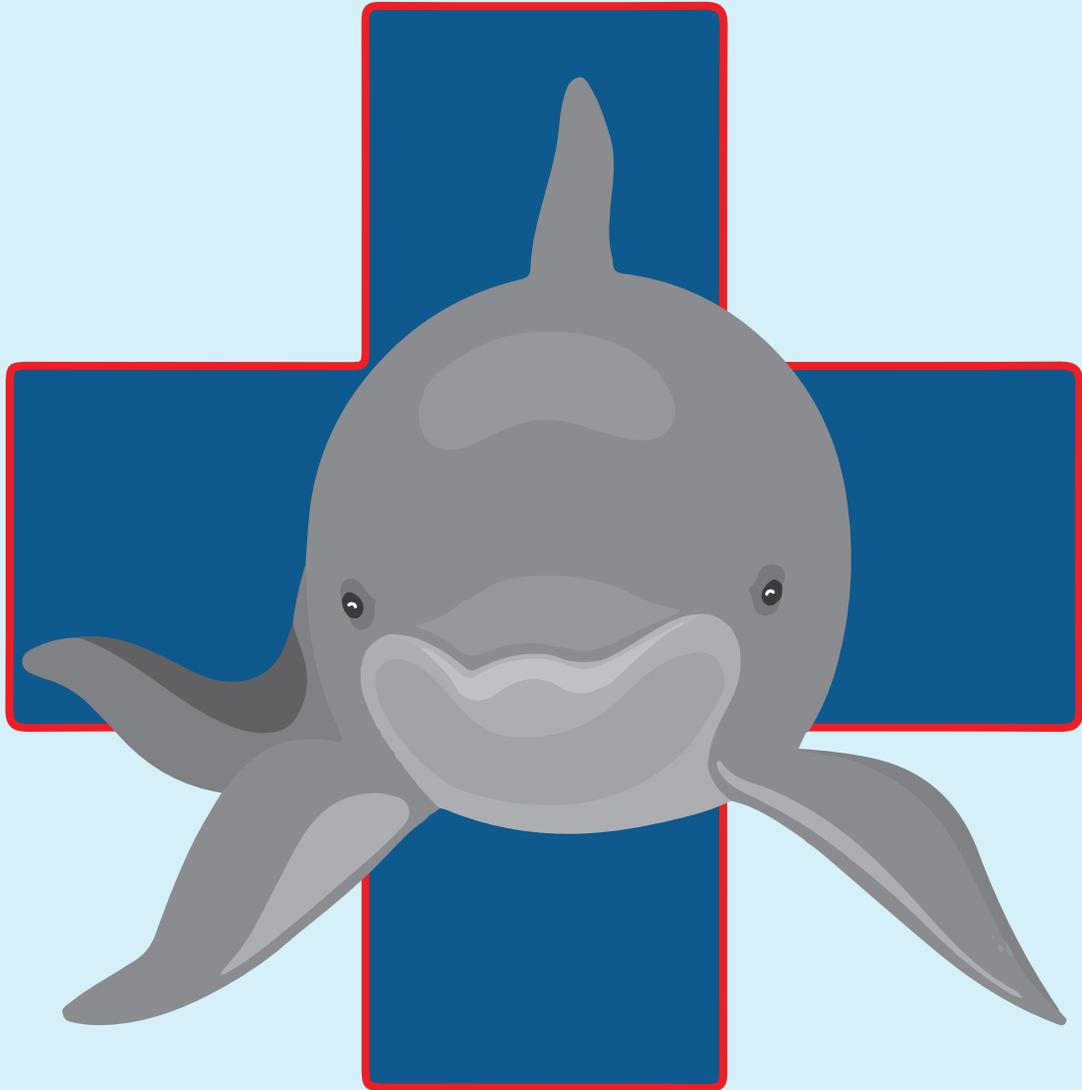


DOLPHIN DOCTOR



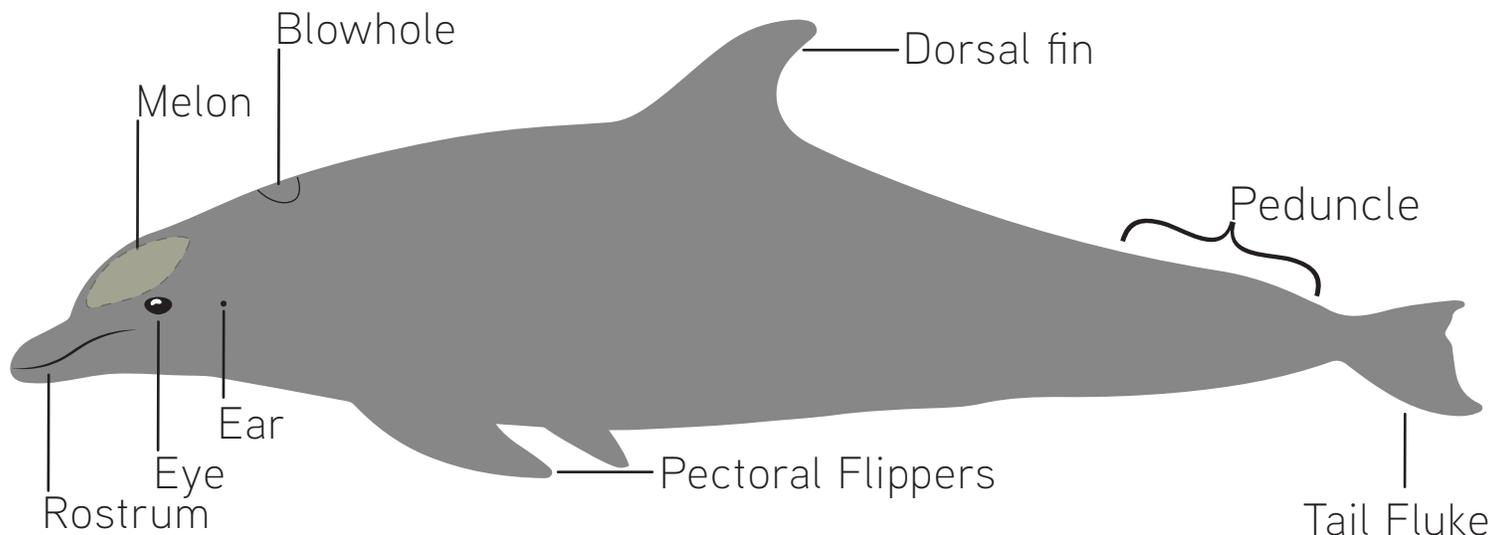
WORKBOOK

Elementary School Version



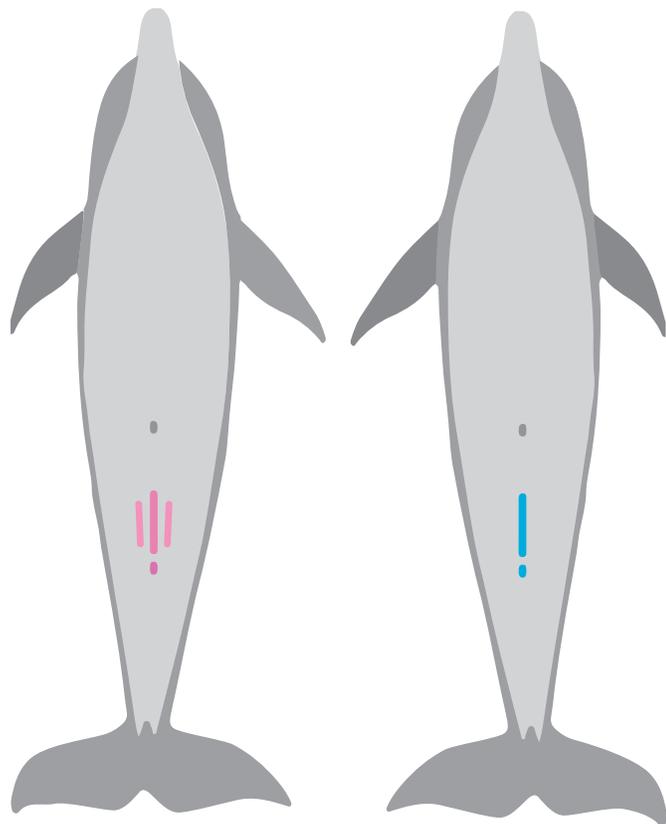


DOLPHIN ANATOMY



How do you tell a boy and girl dolphin apart?
Look at their bellies!

(Hint: look for a division sign or exclamation point!)



Female = \div



Male = $!$

♀ Female = \div

♂ Male = $!$

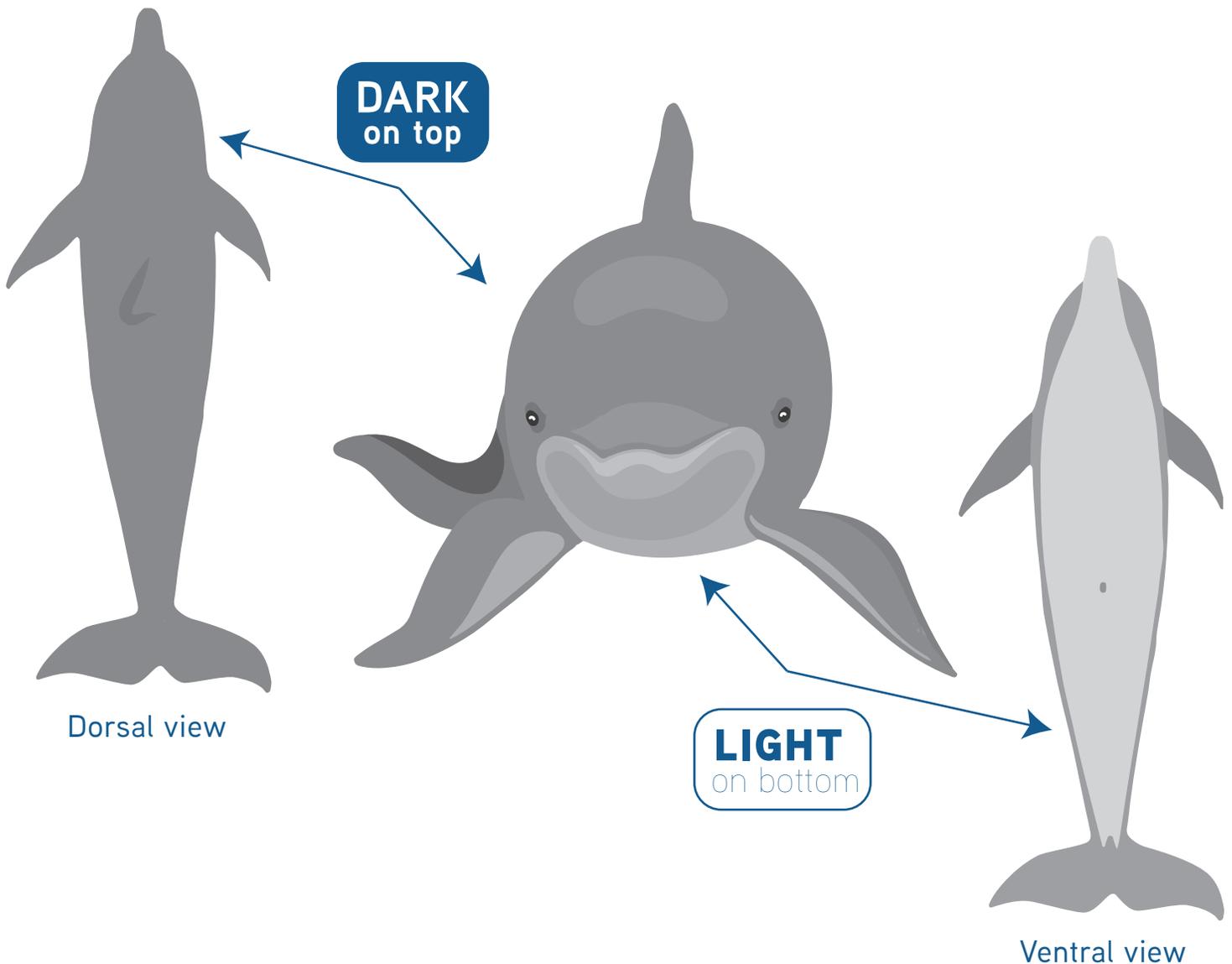


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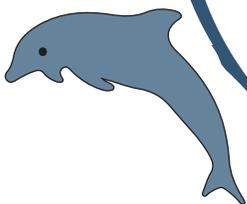
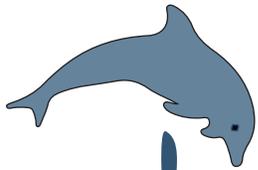
COUNTERSHADING (THAYER'S LAW)

Dolphins have adapted to light penetrating the water from above. Countershading, or Thayer's law, is a method of camouflage in which an animal is darker on the upper side and lighter on the underside of the body. Dolphins use countershading to blend in with their environment. Looking down on them, the dark colors blend in with the ocean. Looking up from underneath, the patches of light and dark skin blend in with the sunlight penetrating the water. By being darker on top and lighter underneath, they help to conceal themselves from predators and prey.



DOLPHIN MAZE

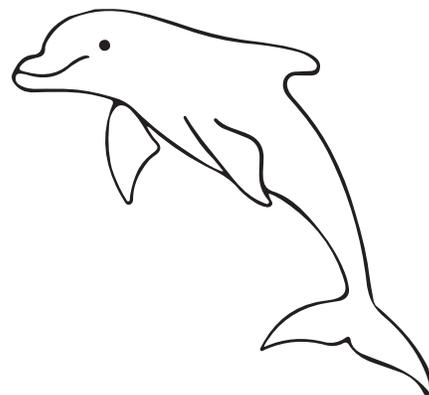
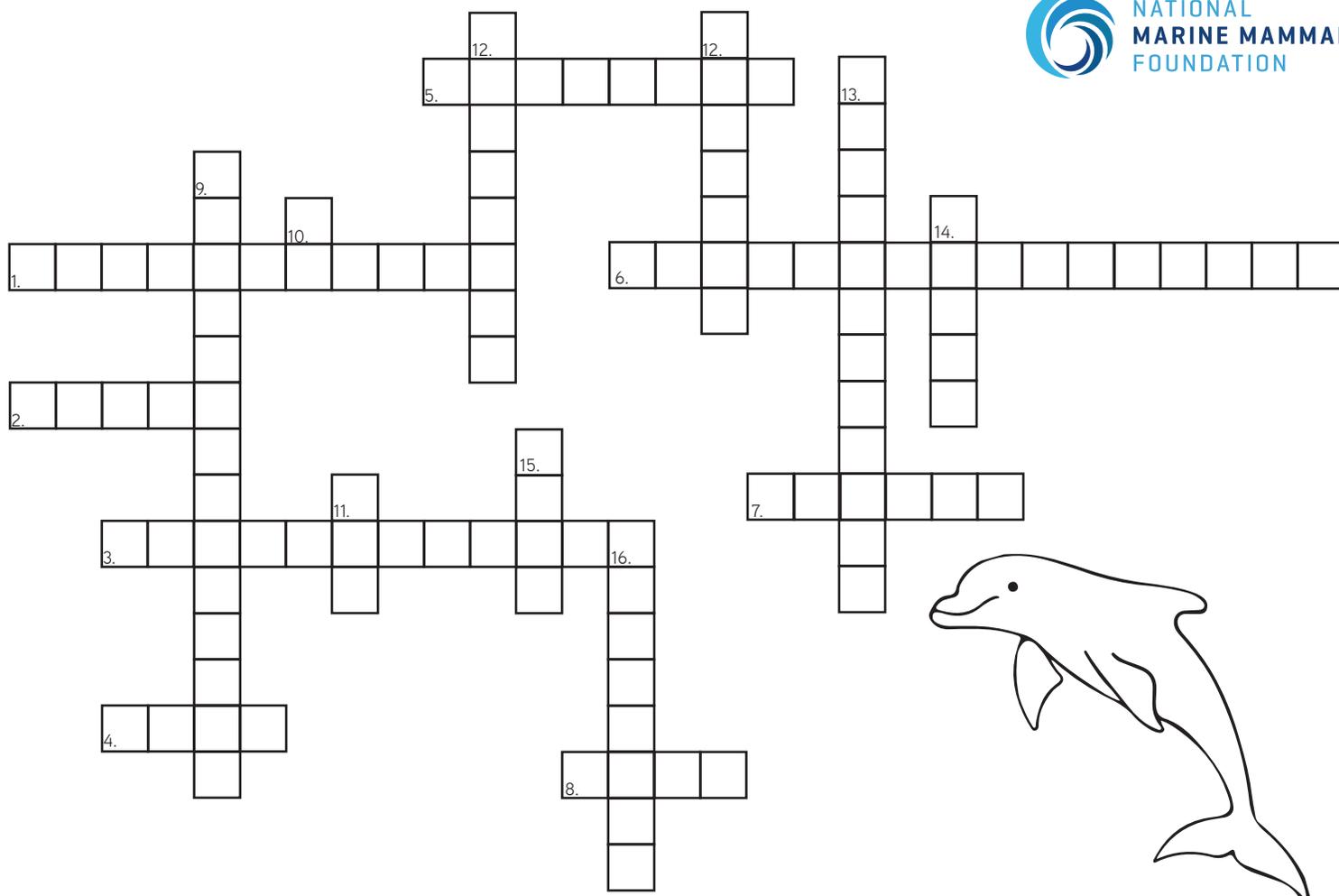
Start



End



CROSSWORD PUZZLE



ACROSS

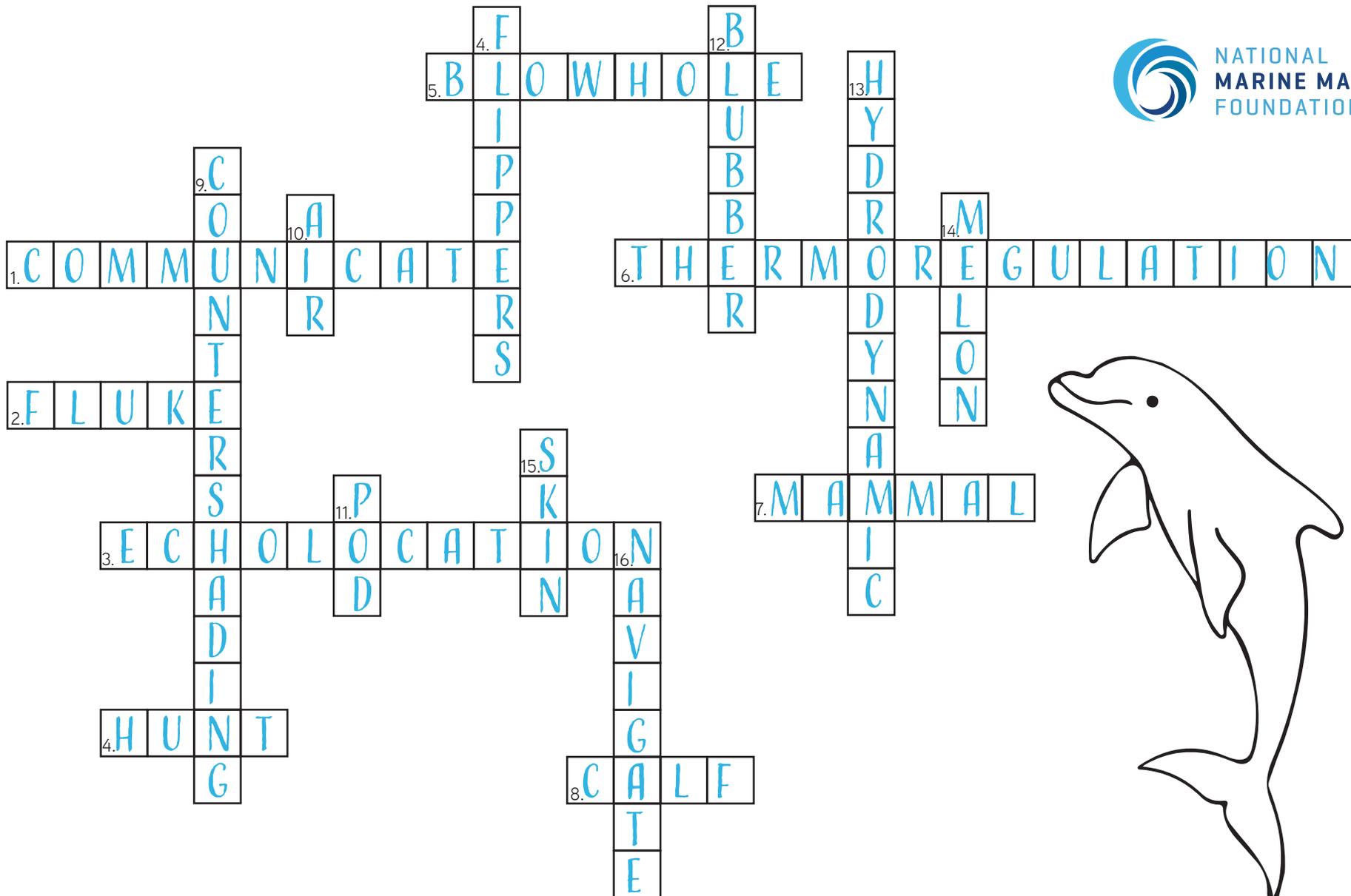
- Dolphins use clicks and whistles to _____, or talk to one another!
- A dolphin's tale is called a _____.
- Dolphins use sound and echoes to detect and locate objects. This is called _____, or bio sonar!
- Dolphins use echolocation to _____ fish.
- Dolphins breathe from their nose (or _____), located on top of their head.
- Dolphins are warm blooded and use their ability called _____ to maintain their body temperature. Their dorsal fins and tail flukes release excess heat from the body!
- Dolphins have hair, give birth to live young, and are warm blooded. This means dolphins are a type of _____ - just like you!
- A baby dolphin is called a _____.

DOWN

- Dolphins are a darker color on their backs to blend in with dark ocean depths, and a lighter color on their bellies to blend in with the bright surface. This form of camouflage is called _____.
- Dolphins breathe _____ and can hold their breath for over 10 minutes! Dolphins also have more red blood cells, so they are able to carry more oxygen throughout their bodies!
- A group of dolphins is called a _____.
- Dolphins have a thick layer of fatty tissue called _____. This helps keep the dolphin warm and makes up 20% of their body weight!
- The dolphin's torpedo-like shape makes it more _____, or able to move more efficiently in water.
- The "bump" on a dolphin's head used to focus the animal's sounds in one direction during echolocation is called the _____.
- Did you know: Dolphin _____ regenerates (or heals itself) 10-20 times faster than a humans' does!
- Dolphins also use echolocation as they travel and find their way through, or _____, their environment.



ANSWER KEY



DO DOLPHINS HAVE HAIR?

Searching for Dolphin Hair

Many don't have a clue.

Others learn it in school.

I read it in a dictionary.

All mammals have hair.

We are mammals and dolphins are too.

How do dolphins pass this mammal test?

Some say dolphins have whiskers: can this be true?

I am a veterinarian, a research doctor too. I should be able to find whiskers if anyone can.

First, I remove my gloves. Then, I touch the dolphin gently with my fingertips.

I touch the dolphin all over the smooth body. What do I discover? Why, his skin is as slick as an olive!

But, wait! I see. Look with me there on the snout: five small pits but not even a single hair.

We, you and I, have learned an anatomical fact about these graceful mammals of the sea! Think about this a little bit more.

When the baby dolphin is in his mother's womb, tiny whiskers fill each of the small pits on his snout; yet, after the baby slides out of his mother's body to swim beside her in the sea, his little head moves back and forth.

As he swims, the water against his skin pulls on the soft hairs, and soon, they all fall out.

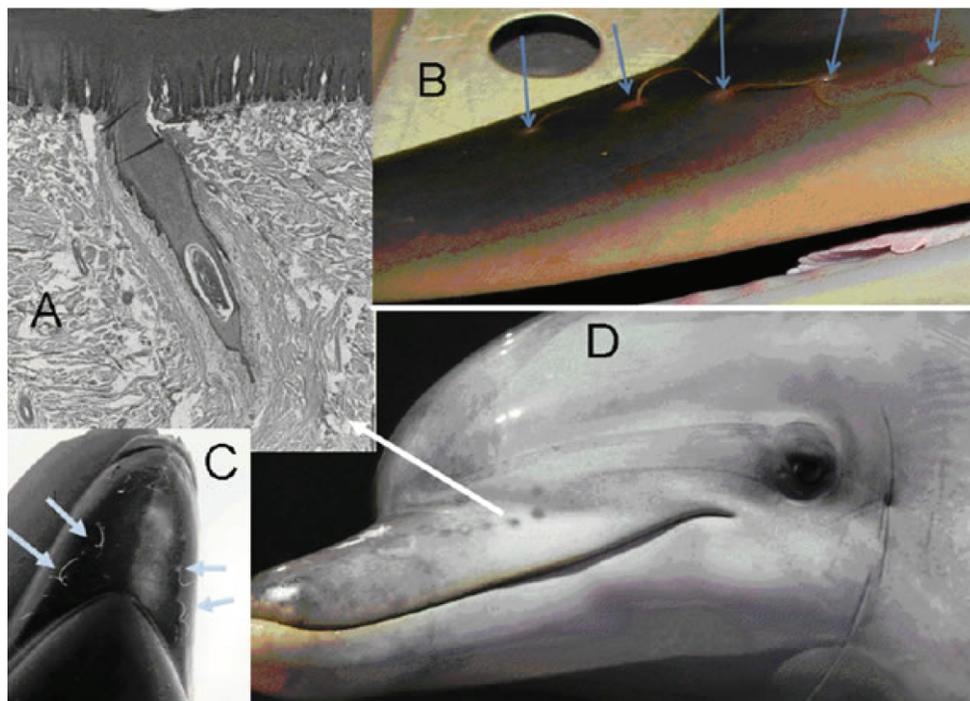
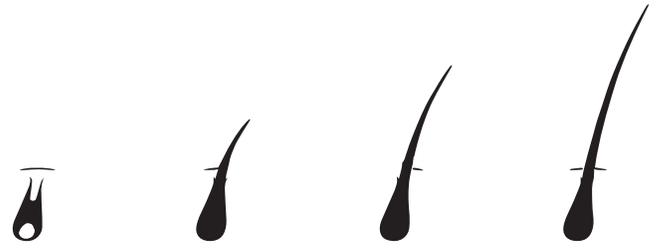
Even after the baby dolphin grows, not a whisker shows.

I shall tell you why: the hair root in each of the pits remains hidden inside.

So, have you discovered why dolphins have hair that they do not show?

For those who still wonder why and have nary a clue, then you must think:

When you want to swim super fast, cover up your hair.



- Dr. Sam Ridgway

* Thanks to Jeanette Ridgway, PhD for help with the words.

In the four pictures to the left you can see the stages of dolphin hair. Figure A shows the hair root that all dolphins have buried in the skin. Figures B and C show with arrows the hairs that stick out around the time of birth. Figure D shows the dark pits that each contain the hair root below.

DO DOLPHINS HAVE BELLY BUTTONS (NAVELS)?

All humans have a navel.

So do dolphins.

The dolphin navel is not a belly button as some human navels are.

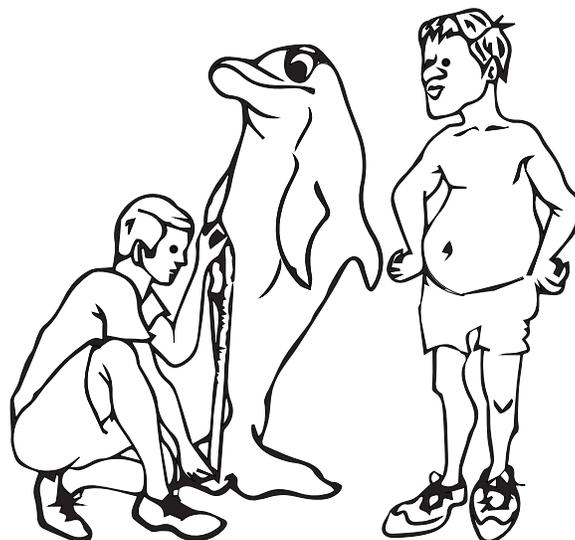
It does not look like a little hole in the belly as some human navels do.

It is not a pouched-out little knot as some of yours are.

The dolphin navel is smooth and slick.

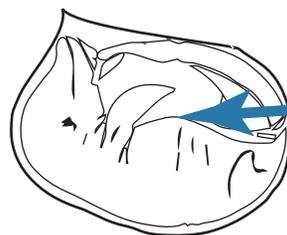
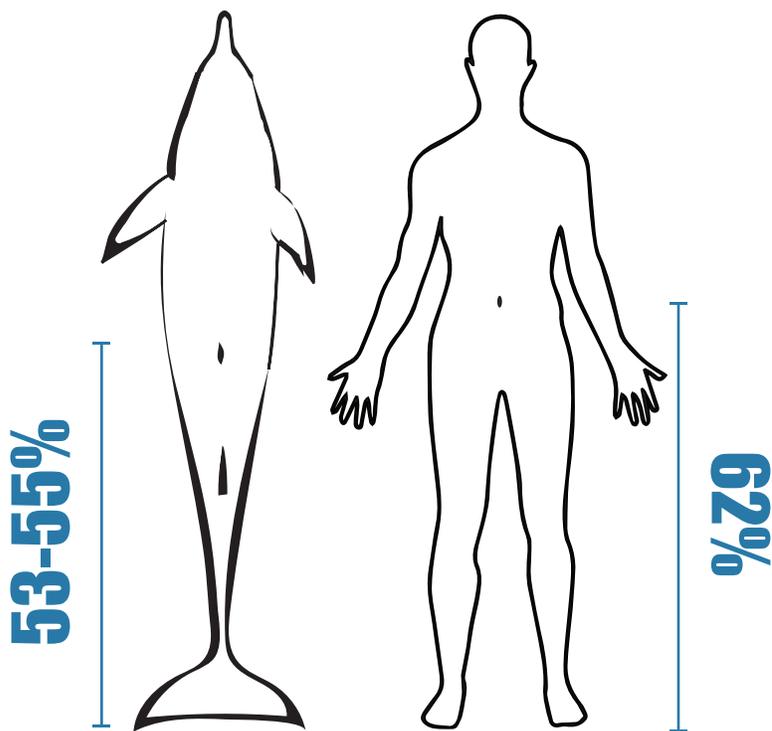
Yet we can see the sign that reminds us of how the dolphin in its mother's womb was connected to the placenta just as all placental mammals are.

- Dr. Sam Ridgway



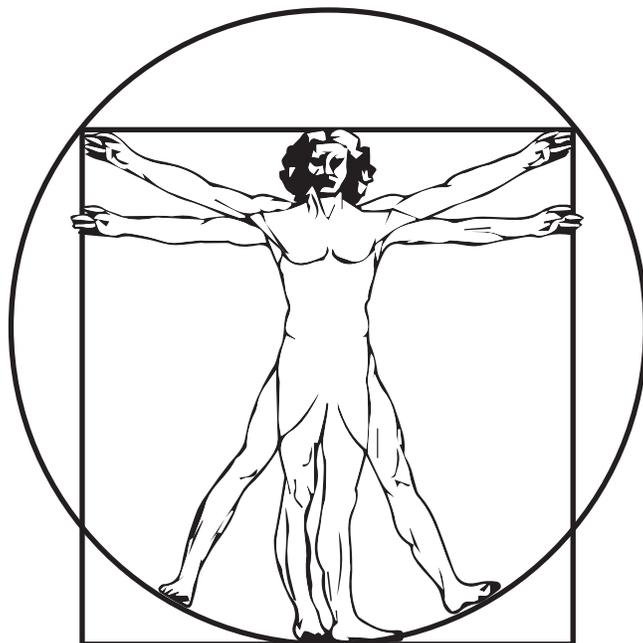
We have measured the height of the dolphin navel. The dolphin navel lies 53 to 55% of total body length from the lower edge of the flukes as shown in Jim Corey's drawing.

The human navel is roughly 62% of height of a standing person from the ground. (A. Motoc et al. Romanian Journal of Morphology and Embryology 2005, 46(1):63-66).



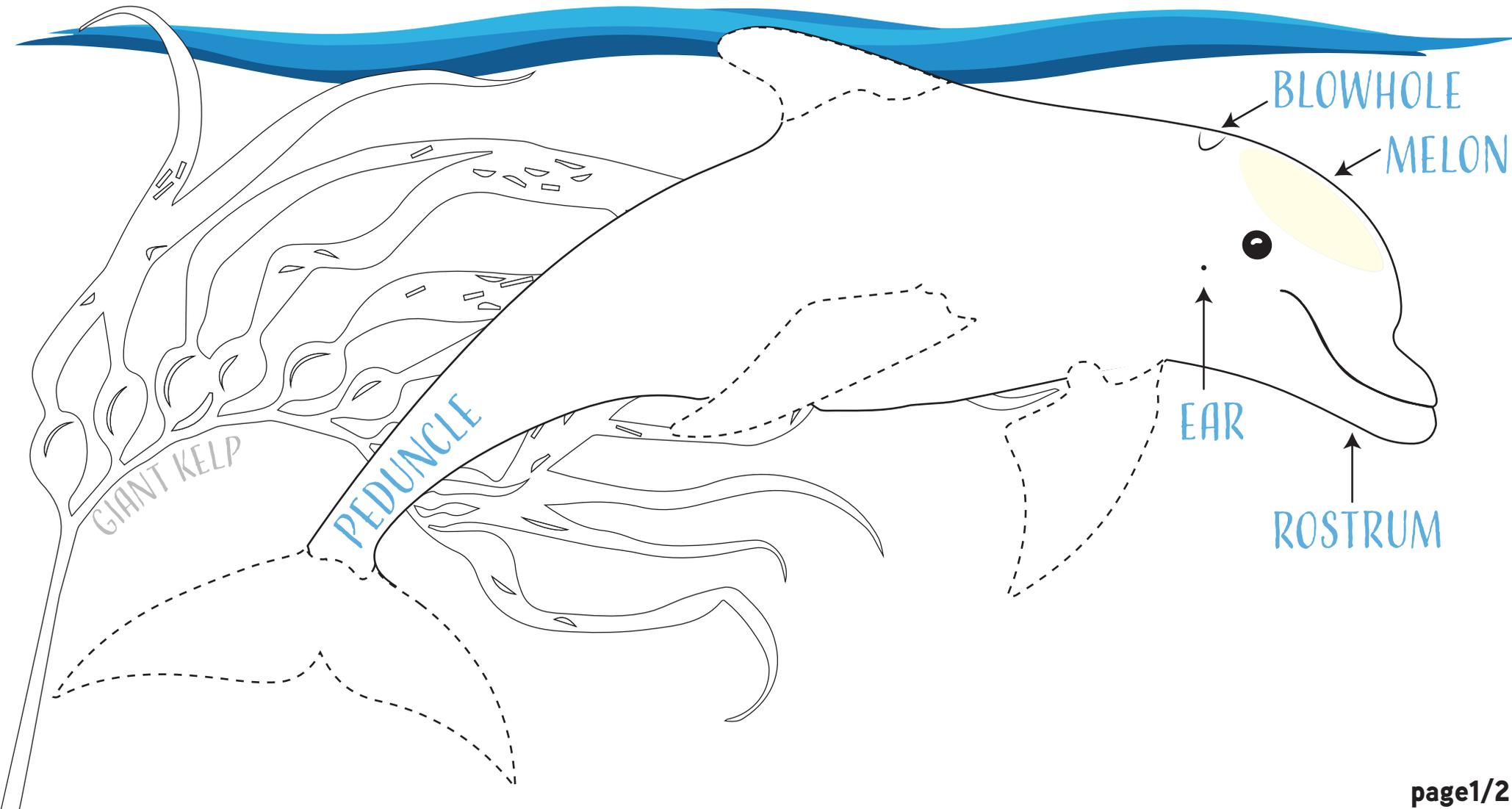
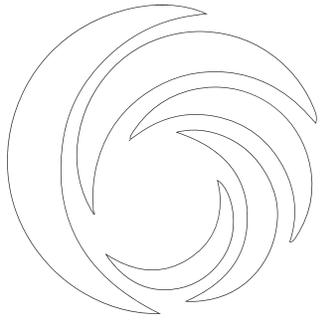
The navel is a sign of how we were nourished in the womb from mother's blood.

In 1490, Leonardo da Vinci made this drawing while working in Florence, Italy. It shows that with our legs spread the right distance apart, the navel is at the center of our body height. Bottlenose dolphins do not have legs. They have a long tail that ends in their flukes. Our measurements show that dolphin's navels are centered as they are.



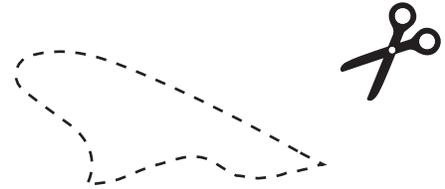
BOTTLENOSE DOLPHIN

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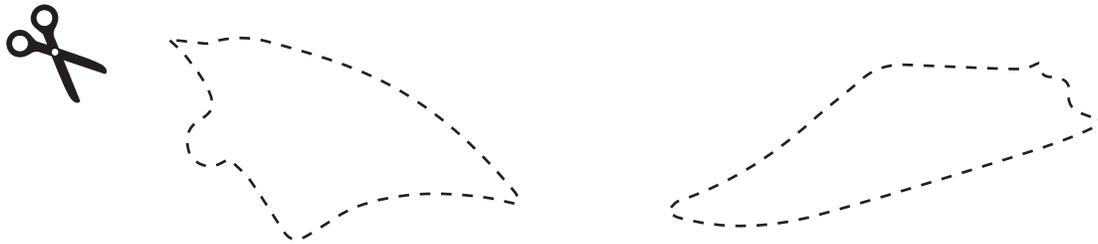


Directions: Read and learn about dolphin fins below. Color the dolphin and ocean scene, then each of the shapes. Cut the five shapes out. Using a glue stick attach the shapes on the correct location of the dolphin!

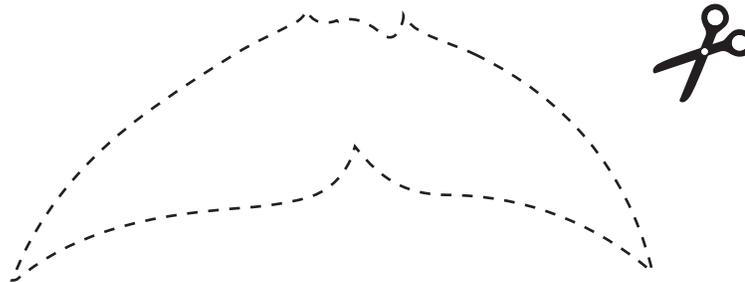
DORSAL FIN: Provides stability like the keel of a boat.



PECTORAL FINS: Help the dolphin steer its body while swimming.



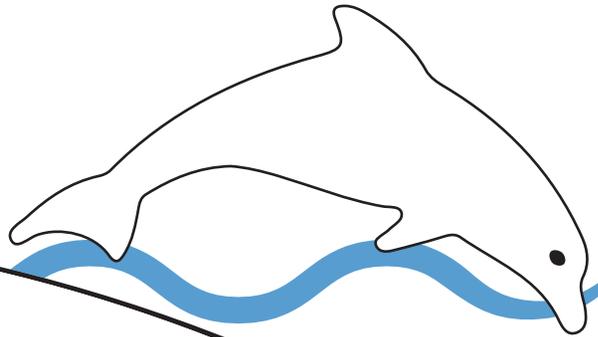
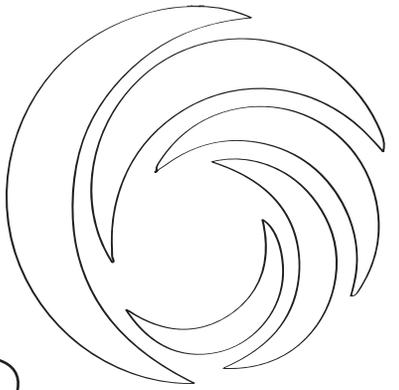
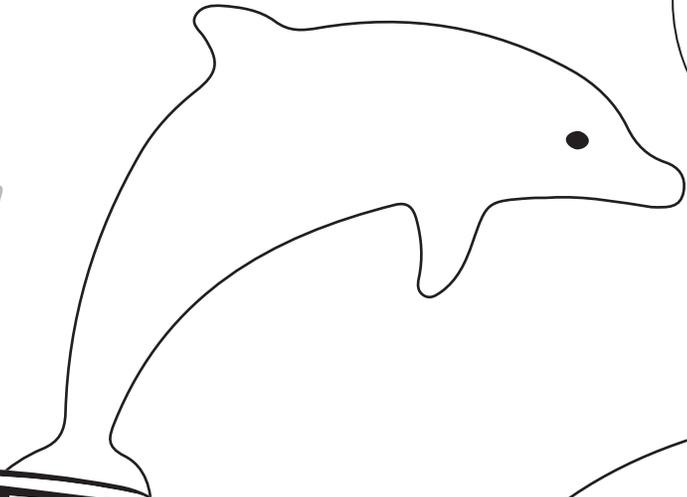
FLUKES: Propel the dolphin through the water.



FIN vs FLIPPER:

Do fins and flukes have bones? The dorsal fin and flukes are made of fibrous connective tissue and have no true bones, however the pectoral fins have bones similar to those of a human hand!

DOLPHIN
DOCTOR +



+ DOLPHIN DOCTOR

