To Tommaso, Anna and Giuseppe.
And to the sea, who often welcomes me into it like the hug of a child.
Paola

To Giacomo, who knows how to dive into wonder.
Rossana



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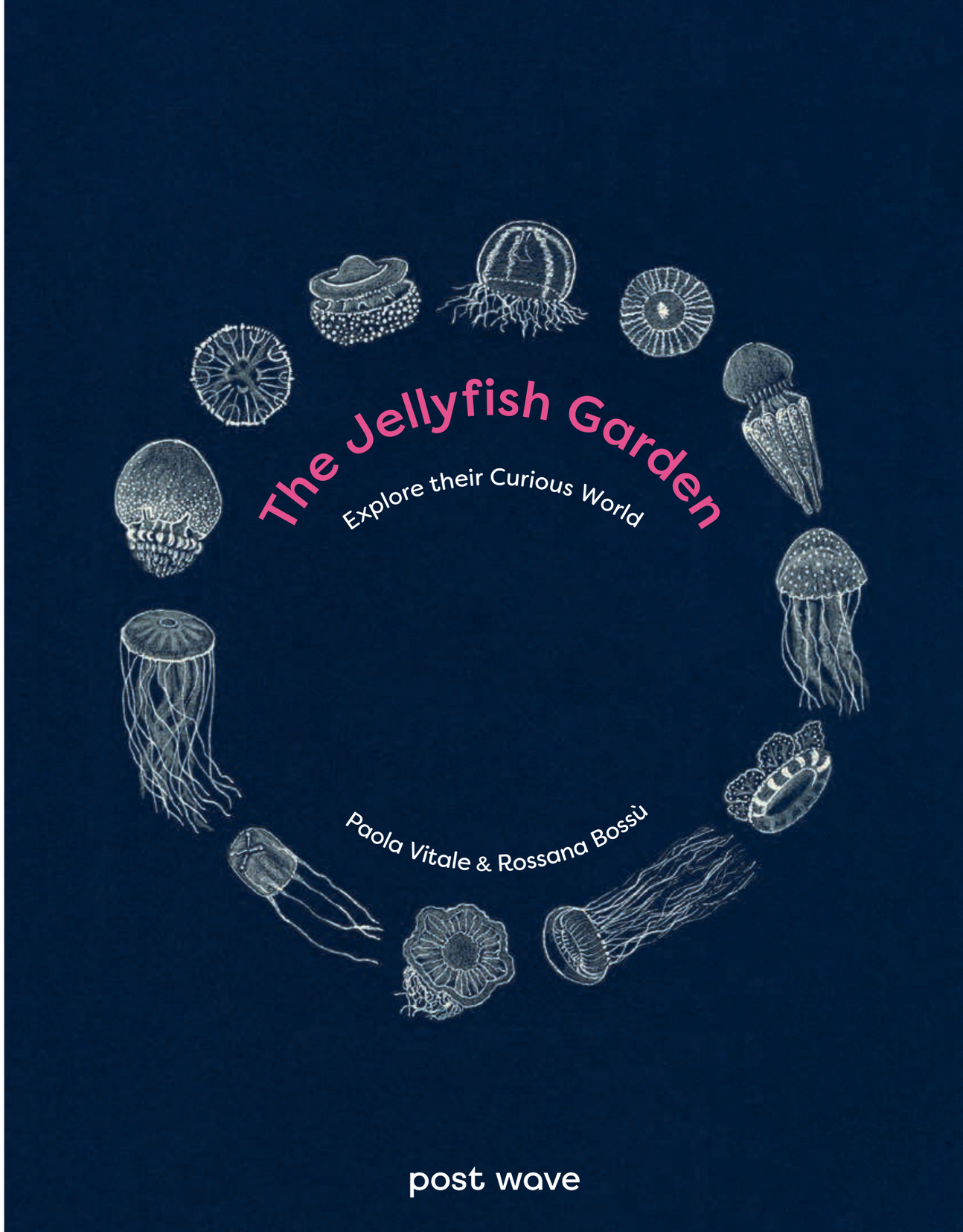
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They fill the waters of the deepest oceans, ports and beaches.

They have transparent bodies full of bright, vibrant colours.

Some are bigger than humans, and some are so small they blend into the salty drops of the sea.

They live everywhere, from the Arctic Ocean to the Great Barrier Reef, in shallow coastal waters and the dark depths of the oceans.

And when they bloom, they look like gardens floating on top of the water...

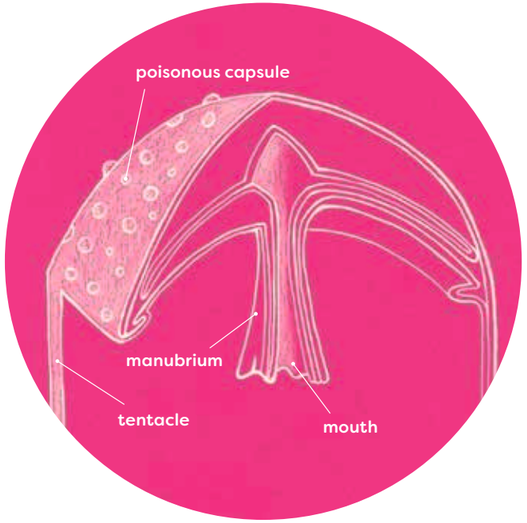
THEY ARE JELLYFISH.

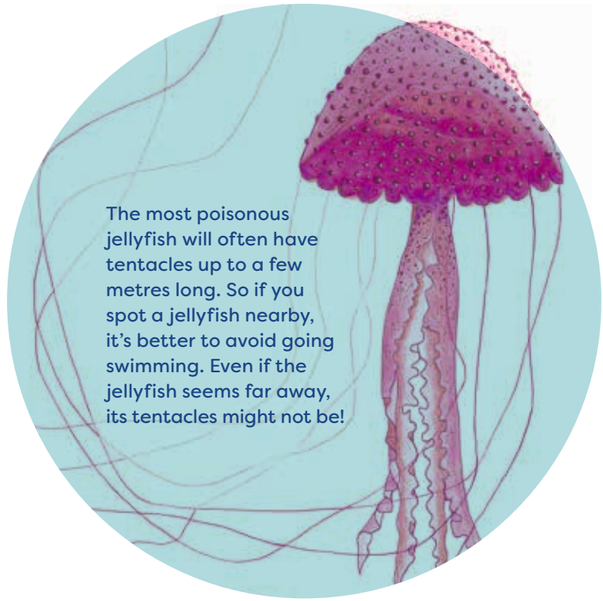


AN UMBRELLA THAT FLOATS

Jellyfish will often emerge at the water's surface so suddenly and in such big numbers, it seems as if they simply fell from the sky. But a rain made of jellyfish would be a very *strange* kind of rain! Instead, they charge quickly to the surface using their bodies to propel them. The curved part at the top of their bodies (the bell) gives them an umbrella-like shape. Once they break above the waves, they look a bit like colourful floating umbrellas, and sometimes plates or helmets.

Jellyfish have four or more tentacles that hang from their body. The length of these tentacles depends on the species. A jellyfish's mouth sits under its umbrella-shaped bell, on a tube-like structure called the manubrium. Jellyfish often have capsules containing poison among their tentacles, manubrium and the entire surface of their bell. Most jellyfish are carnivores so they use the poison to paralyse their prey and capture them.

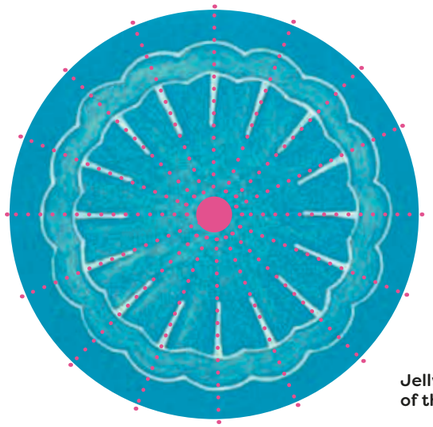




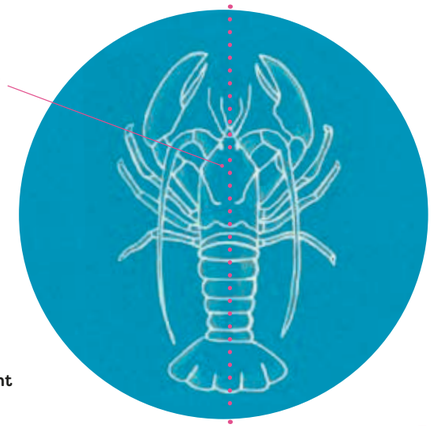
The most poisonous jellyfish will often have tentacles up to a few metres long. So if you spot a jellyfish nearby, it's better to avoid going swimming. Even if the jellyfish seems far away, its tentacles might not be!

A SPECIAL SYMMETRY

Jellyfish have a rare shape that few other animals share. Though having a head positioned at the front of the body is more useful for looking around and going faster, jellyfish don't actually *need* to go fast. Instead, they spend most of their lives anchored to the seabed. And they've barely changed for millions of years, so perhaps they are perfect just the way they are!

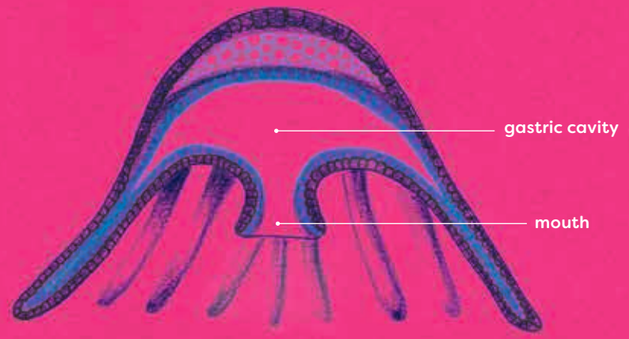


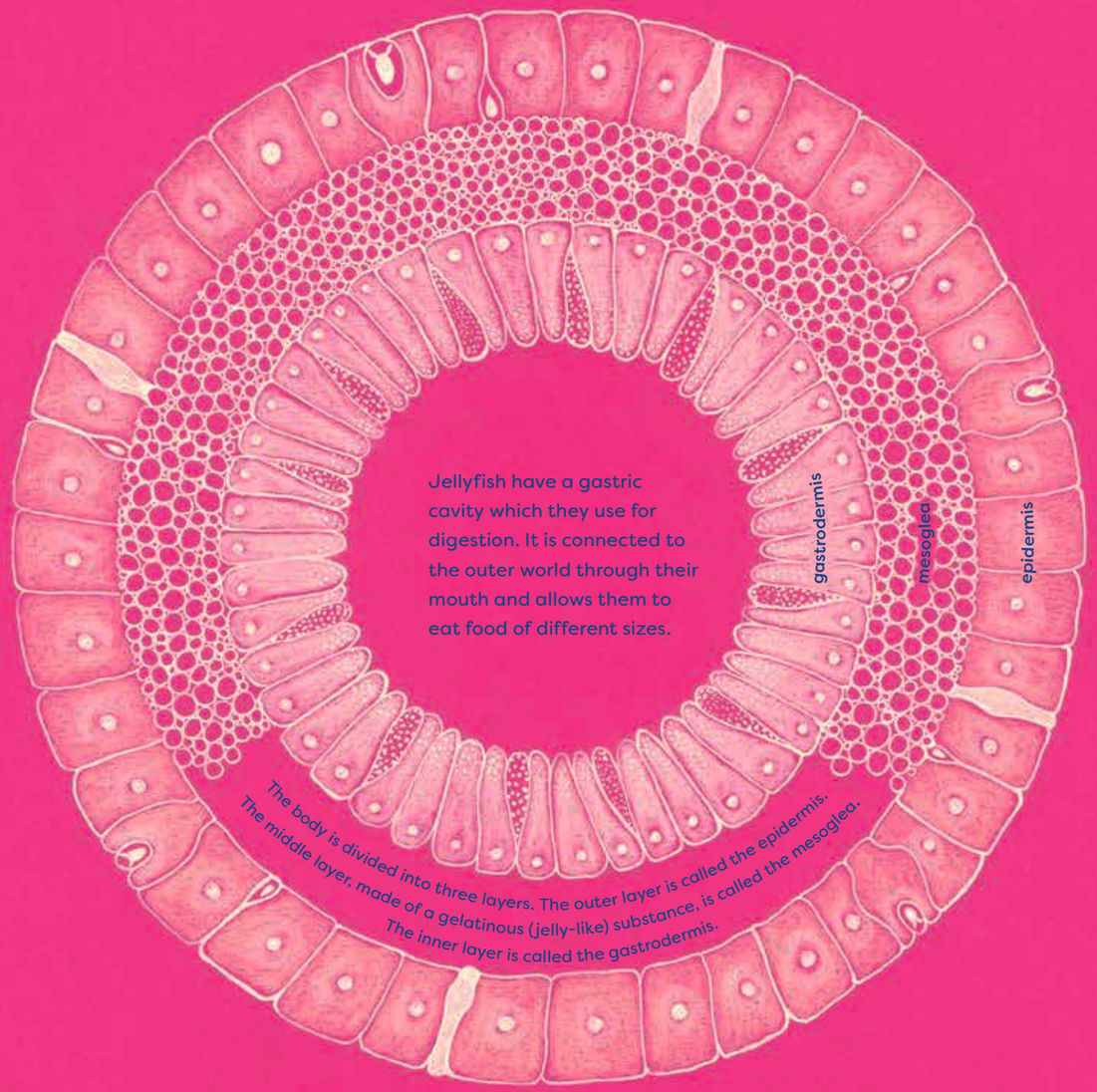
Jellyfish do not have heads in front of their bodies like other animals.



ARE JELLYFISH ANIMALS?

Jellyfish are invertebrates, meaning they have no backbone. They are also metazoans, which means that their bodies are made of multiple cells that form tissues and organs. Invertebrates and metazoans are animals.



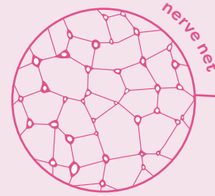


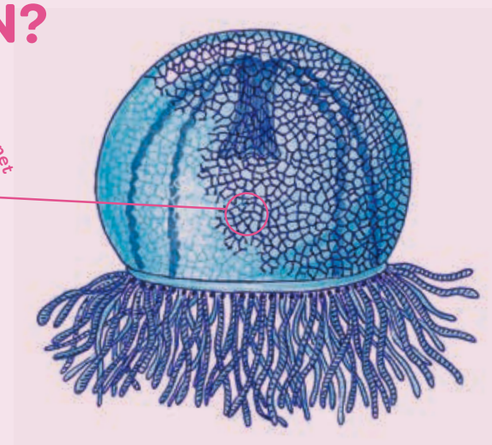
Jellyfish have a gastric cavity which they use for digestion. It is connected to the outer world through their mouth and allows them to eat food of different sizes.

The body is divided into three layers. The outer layer is called the epidermis. The middle layer, made of a gelatinous (jelly-like) substance, is called the mesoglea. The inner layer is called the gastrodermis.

DO THEY HAVE A BRAIN?

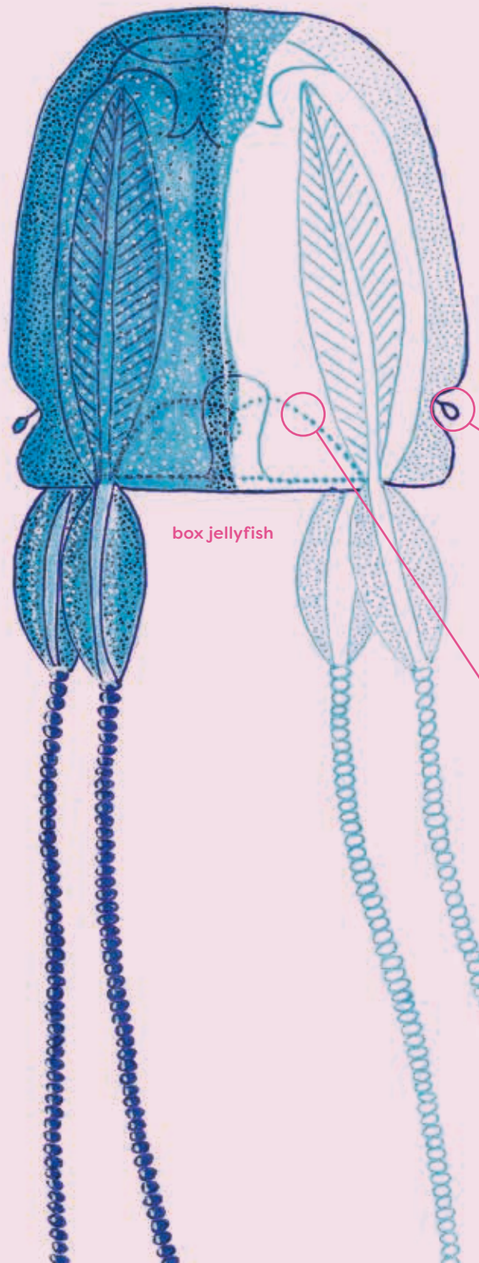
Jellyfish don't have a proper brain – they have some nerve cells connected together by a web called a nerve net. This helps them to detect changes in their environment, including temperature, oxygen levels, vibrations and currents.

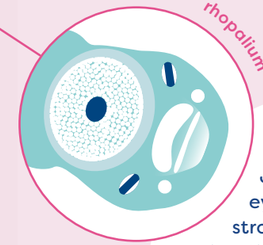




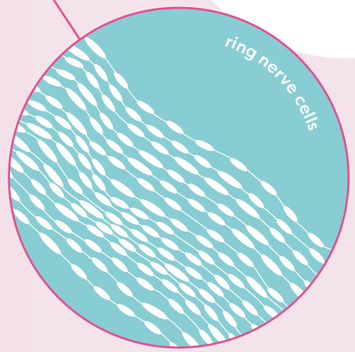
They also have clusters of nerve endings along their bells, called rhopalia. These enable jellyfish to sense light.

Only box jellyfish, so named because of their box-shaped bell, are a little more complex. Their nerve cells are organised into rings, and their eyes, located in the rhopalia, steer towards light sources. One rhopalium can hold up to six eyes.





Jellyfish have simple eyes which don't like strong lights. During the day, they will normally come to the surface only when it is cloudy, or at dusk. At nighttime or when the sun is bright, they'll swim to the seabed to rest.



JELLYFISH AND OTHER JELLIES

Jellyfish belong to a group of animals called Cnidaria, and almost all of them belong to its subgroup called Scyphozoa.

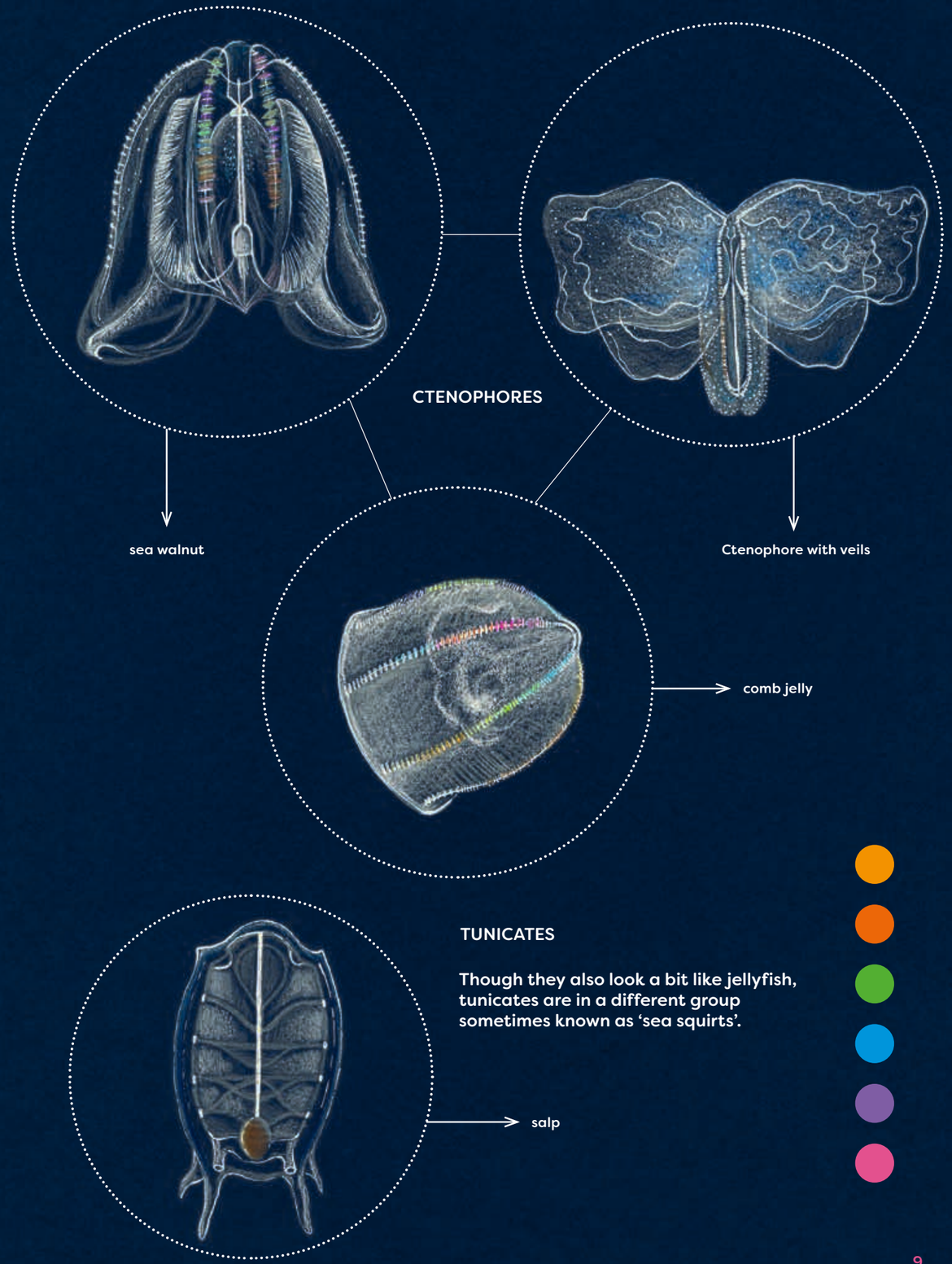
The Cnidarian group includes the subgroups: Scyphozoa also known as ‘true jellyfish’ (such as the lion’s mane jellyfish) and Cubozoa (such as the box jellyfish). Comb jellies, though they look like jellyfish, aren’t actually jellyfish at all and are part of the Ctenophora group.



polyp

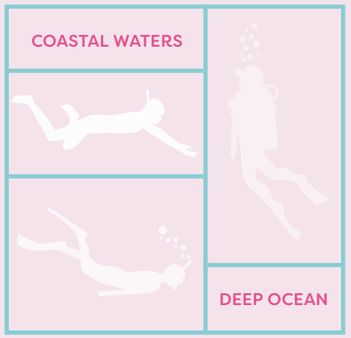
mature jellyfish

When jellyfish are still larvae (the early form of these animals after they’re born), they live as polyps. At this stage they look like corals: little stems anchored to the seabed. On top of the polyp is a mouth surrounded by tentacles to capture and swallow its prey. It is only when they are adults that jellyfish float around freely, dragged along by the current in their umbrella-shaped bodies.



DO JELLYFISH SWIM?

Thanks to a crown-shaped system of muscle at the bottom of the bell, jellyfish can swim by pushing away water in rhythmic pulsations. The almost rubbery texture of their mesoglea helps them to return to their starting point after each pulsation.



Jellyfish live everywhere, from coastal waters...

...to the deepest parts of the sea.

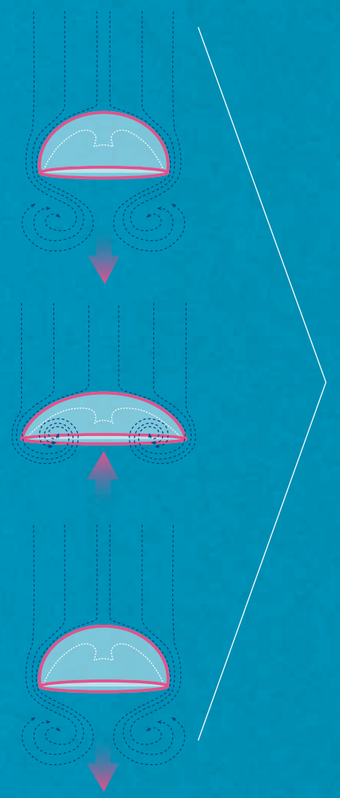
Jellyfish swim mostly in a vertical direction, though they often spin while doing it. Horizontal movements, on the other hand, mostly happen because of the direction the water is moving in. Only some kinds of jellyfish, such as tropical Rhizostomae and some box jellyfish, can *really* swim horizontally.



The fastest jellyfish can swim at speeds of around 6m to 100m per minute. Their speedy secret is hidden in the wavy edge of their bell that acts like a veil which helps them to push higher with each pulsation.

HOW JELLYFISH SWIM UP

Jellyfish swim by rising up with a series of pulsations, then they drift down slowly and start again.













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