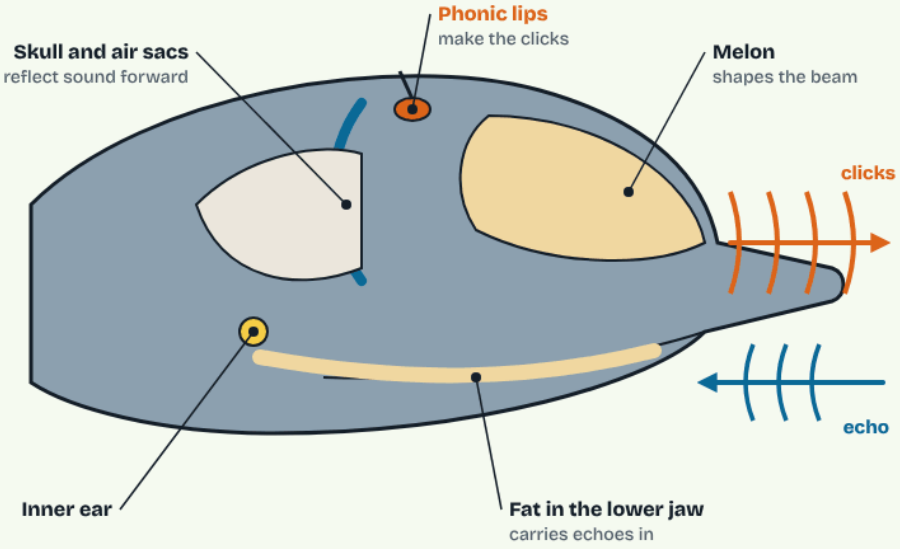
That is why

How does dolphin echolocation work?

A dolphin sends out clicks, beams them forward through its forehead and listens to the echoes through its lower jaw.

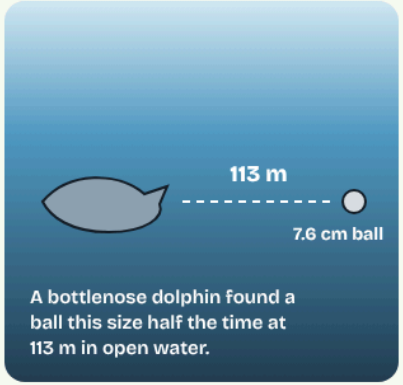
A Inside the head



Click, wait, listen

Sound travels about 1,500 m a second in seawater. An echo from 113 m away comes back in about 0.15 s, and the dolphin times its next click so the echo arrives first. The delay tells it the distance; the echo tells it shape and size.

B The ball test



1 Very high pitch

Clicks peak at up to 120 kHz; we hear up to about 20 kHz.

2 A narrow beam

The click beam is only about 10° wide, like a torch.

C What echoes reveal

1 Distance

From the time it takes the echo to return.

2 Size and shape

From how strong the echo is and how it changes.

3 What it is made of

Metal, fish and sand each echo differently.

Up close, quieter

As it nears a target, the dolphin clicks more softly and more often.

A dolphin builds a picture from echoes, not light.

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