



# WHAT IS A FISH?

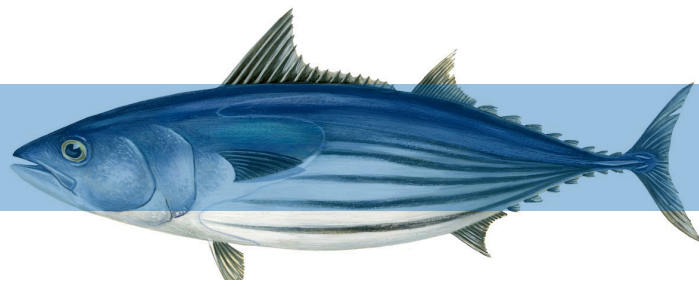


**Teacher resources - Lesson plan**

Image credit: James Thornton



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## Australian Curriculum Objectives

### Years 5 & 6 (Stage 3) - Science

- [AC9S5U01](#)  
Examine how particular structural features and behaviours of living things enable their survival in specific habitats
- [AC9S6U01](#)  
Investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions

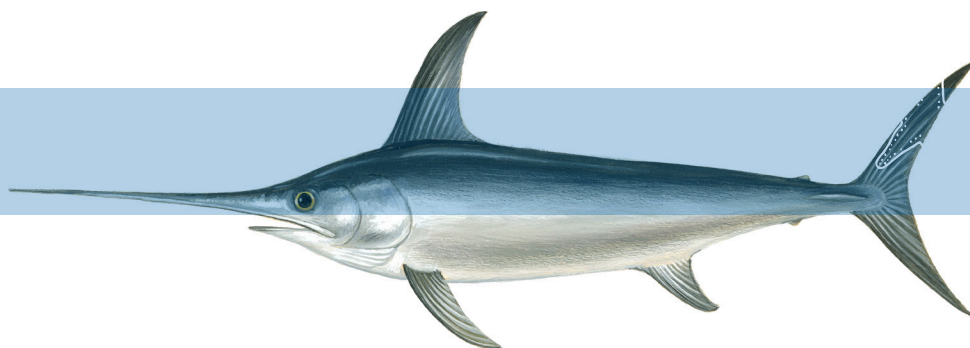
Extension only

- [AC9S5I04](#) / [AC9S6I04](#)  
Construct and use appropriate representations, including tables, graphs and visual or physical models, to organise and process data and information and describe patterns, trends and relationships

Also useful for

### Years 7 & 8 (Stage 4) - Science

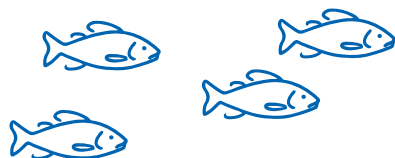
- [AC9S7U01](#)  
Investigate the role of classification in ordering and organising the diversity of life on Earth and use and develop classification tools including dichotomous keys



In this lesson for learners aged 10+ students learn about the scientific characteristics of a fish, the unique features that different fish species have and how that influences their habitats and behaviour.

### Key terms

- Fish species
- Vertebrate
- Gills
- Dorsal Fins
- Body shape
- Adaptation
- Habitat
- Overfishing



### You will need

- Printed or projected copies of the Ocean Connection cards (pages 5 to 8)
- Printed or digital copies of the Prior Knowledge Chart (page 9)
- Access to the video [Why are fish fish-shaped](#)
- Access to the Kahoot quiz [Science for Sustainable Oceans](#)
- Printed or shared digital copies of the Fishy Factsheet (pages 10 and 11)
- Printed or projected copies of the Scientific Key

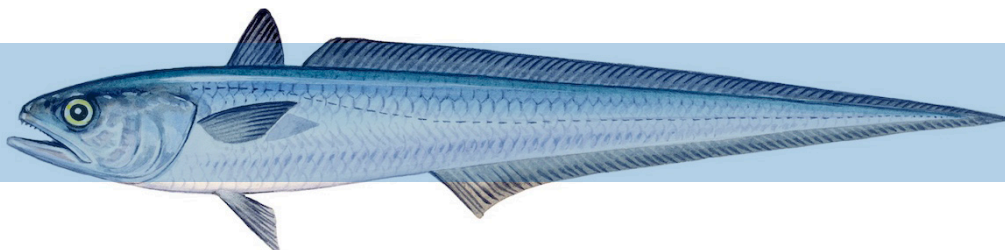
### Key questions

- How are we connected to the ocean?
- What is a fish?
- Why are fish fish-shaped?
- What do different fish shapes tell us about their behaviour?
- How can we use science to learn more about fish and their adaptations?

### Class Activities

- Learners consider their connections to the ocean
- Learners read a factsheet to learn what makes a fish a fish, and complete exercises
- Learners watch a video about overfishing
- Learners watch a video about different fish adaptations
- Learners use a Scientific Key to investigate what a fishes fin shape says about where it lives
- Learners complete a knowledge chart at the start and the end of the lesson





### Starter (5-10 mins)

Begin by asking students to consider their personal connections to the ocean, using the Ocean Connection cards (pages 5-8) to kick start ideas:

- *What is the ocean?*
- *What are their favourite marine creatures?*
- *What are their favourite seafoods?*
- *What might it feel like to live underwater?*

### Main activity (30-40 mins)

Introduce students to the topic of 'What is a Fish'. Complete columns 1 and 2 of the Prior Knowledge Chart on page 9 as a class.

A fish is a scaly skinned vertebrate (animal with a backbone) that lives in the water and breathes using gills.

Ask students to use the Fishy Factsheet on pages 10-11 including the Factbox and video. Then complete Exercises 1 and 2 on page 13.

Next, show students the video [Why are fish fish-shaped](#) (4:56) from TED-Ed.

Students use the Scientific Key to complete Exercises 3 and 4 on pages 13 and 14.

### Discussion (5-10 mins)

Show students the video [Fish bait ball in open water](#) (3:39) from the BBC Blue Planet.

Discuss

*How might deep oceans creatures benefit from open ocean pelagic feeding frenzies like this one?*

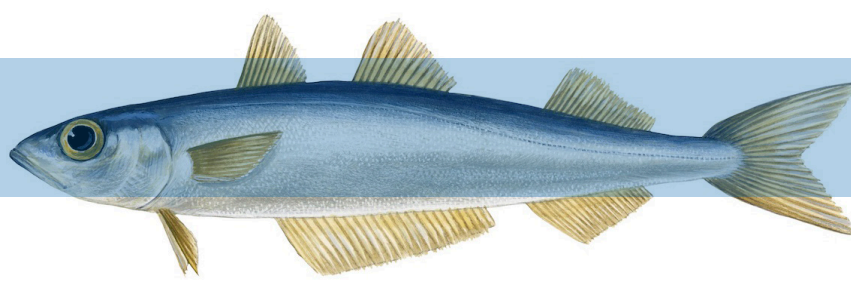
Then complete the knowledge chart using the questions below to guide class discussion

- *What is it like to live in the ocean?*
- *What special features (adaptations) do fish have to help them live in the ocean?*
- *How can we use science to learn about fish and their adaptations?*

If time allows, you could also discuss why isn't a dolphin classified as a fish?

- *What do dolphins and fish have in common?* (live underwater, vertebrates, fins, eyes, mouth etc.)
- *Why is a dolphin not a fish?* (breathe with lungs instead of gills, must go to the surface of the water to breathe air, warm blooded, give birth to live young, feed their young with milk etc.)





## Review

Host a 5-minute Kahoot challenge on this topic at [Science for Sustainable Oceans](#)

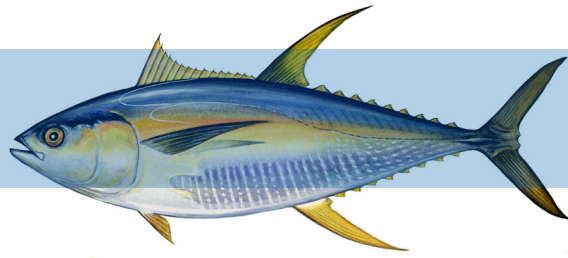


## Extension Activities



1. Students use the Scientific Key and their own research to complete Exercise 5 (page 15)
2. Students read the WA Rock Lobster Fishery worksheet and complete the questions
3. Explore the Australian Fisheries Management Authority (AFMA) [fish species guide](#) and choose THREE species of Australian fish. Complete the Fish Adaptations worksheet on page 15
4. Complete the Sustainable Fishing Class Field Trip - see activity sheet for more details





# OCEAN CONNECTIONS - OCEAN CREATURES



Shark



Stingray



Sea lion



Seahorse



Whale



Sea turtle



Clown fish

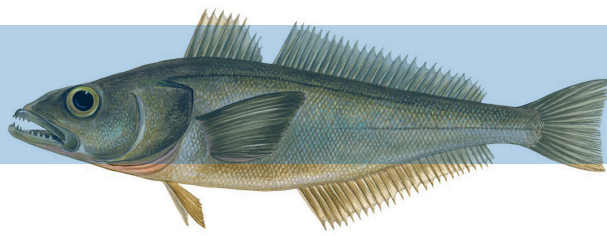


Octopus



Jellyfish





# OCEAN CONNECTIONS - SEAFOOD



Tuna Sandwich



Fish Curry



Fish, Calamari and Chips



Fish Taco



Sushi



Prawn Dumpling



Seafood Pasta

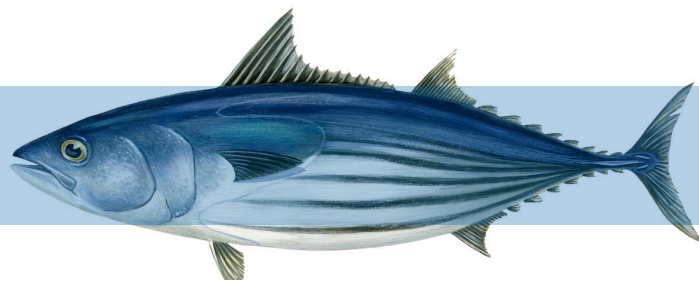


Panfried Salmon



Oysters





# OCEAN CONNECTIONS - SPACE (GEOGRAPHIES)



Ocean wave



Estuary



Coral Reef



Maritime Harbour



Sea floor



Beach



Aerial ocean



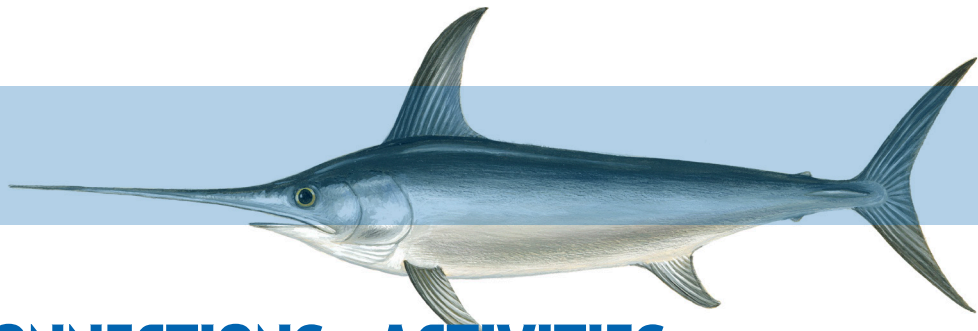
Under the sea



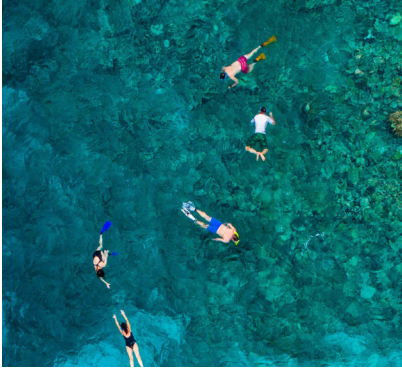
Sea Ice



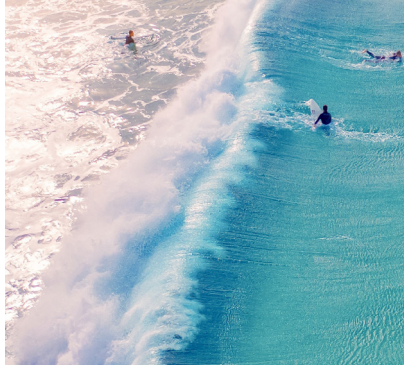




# OCEAN CONNECTIONS - ACTIVITIES



Snorkelling



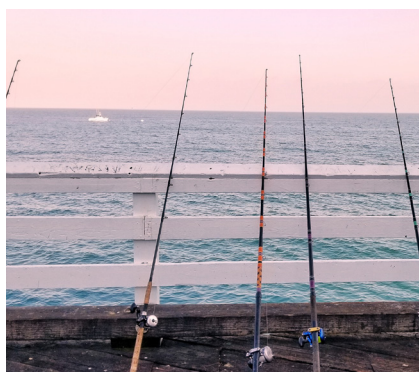
Surfing



Boating



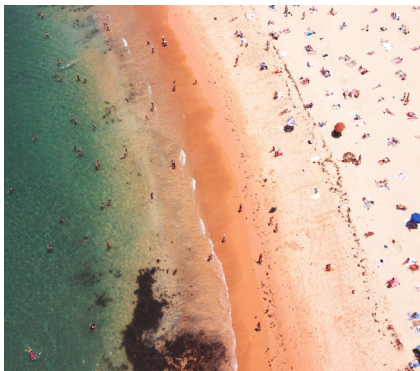
Diving



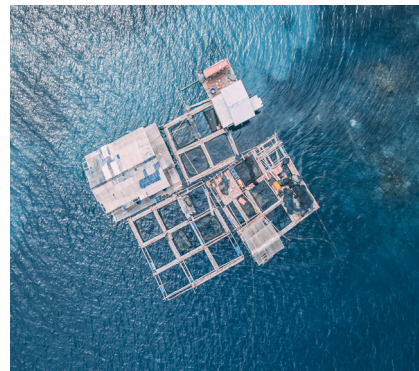
Fishing



Aquariums



Relaxation



Fish Farming



Trade



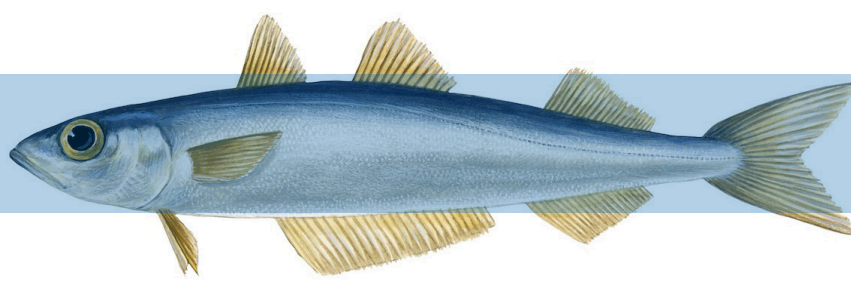


## PRIOR KNOWLEDGE CHART

### WHAT DO WE KNOW ABOUT MARINE HABITATS?

What we know	What we would like to know	What we have learned





# FISHY FACTSHEET

## Definition of a fish

A fish is a scaly skinned vertebrate (animal with a backbone) that lives in the water and breathes using gills.

## About fish

There are many different types of fishes. Fishes are grouped (classified) into three groups:

1. Jawless fish,
2. Bony fish, and
3. Cartilaginous fish (sharks and rays)

## Where do fish live?

Fish live in all different kinds of ocean (marine) and freshwater (aquatic) environments, including coral reefs, the sandy sea floor, the open ocean, in rivers or in lakes.

## How do fish breathe?

Fish have adapted (changed) to live in aquatic places. Instead of lungs they have gills for breathing. Fish take water through their mouths and their gills extract oxygen from the water around them.

## What are fish made of?

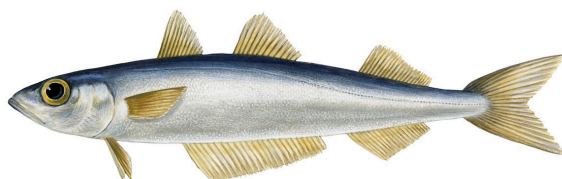
Fish are vertebrates which means they are animals with backbones. Fish skeletons are made mostly from bone (so they are often called the bony fishes). Sharks and rays have cartilaginous skeletons made of calcium phosphate and other minerals. Fish are usually covered in scales that have a layer of slime over them. This helps their movement through the water.

## Colour and camouflage

Another adaptation that helps with survival is camouflage. The colours and patterns on a fish help it to blend in with its surroundings. Many fish are lightly coloured on their underside and darker in colour on their topside. This makes the fish less obvious to predators looking from above (into the darker depths) or below (looking up towards the lighter surface).

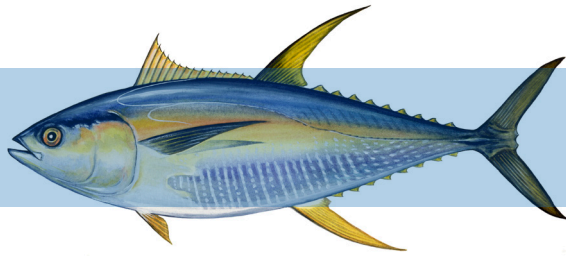
## Why does a fish have fins?

Fish have several different fins. The dorsal fin (on their back) helps the fish to stay stable. The caudal or tail fin helps the fish move through the water. Pectoral and pelvic fins are for steering, balance and braking.



*Micromesistius Australis* / Southern Blue Whiting





### Fish shapes

Fish come in a big variety of shapes and sizes. Fish shapes have adapted to suit their habitat and how they hunt (and are hunted). Most torpedo shape fish live in open water and are excellent swimmers. There are no rocks or reefs to hide under or behind in the open water, so fast swimming is a good strategy for survival! Some fish have flattened bodies and lie on the seafloor waiting for prey to swim by. A scientific key like this one helps us figure out what the shape of a fish might mean.

### Fish mouths

The mouth of a fish gives us some clues about how the fish captures its food. For example, fish with long skinny snouts hunt for food in cracks and crevices. Some fish have wide mouths for gulping and others have tiny teeth for nibbling. Other fish have larger sharp and pointy teeth for ripping and tearing in to their prey.

### Fish eyes

Some fish have eyes on the top of their heads. These fish spend more time looking up for prey and are most likely bottom dwellers [fish that spend time on the bottom of the sea]. Eyes on either side of the head suggest a fish spends time swimming above the bottom.

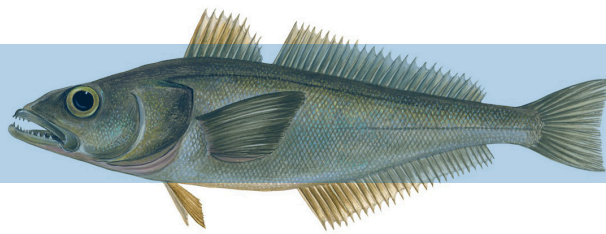
#### Factbox: The Future of Fish

Scientists estimate that there are 33,600 different species of fish in the ocean today, and there could be thousands or even millions more that we have yet to discover! Scientists suggest that 95% of the ocean is still unexplored.

Fish is also one of the only remaining wild food sources we have left. However with the increasing global demand for fish, over a third of fish populations are now overfished and a number of fish species are at risk of collapse.

Watch the video [Overfishing](#) (2:55) from the film My Dad the Fisherman to learn about what we can do to protect fish species for the future.

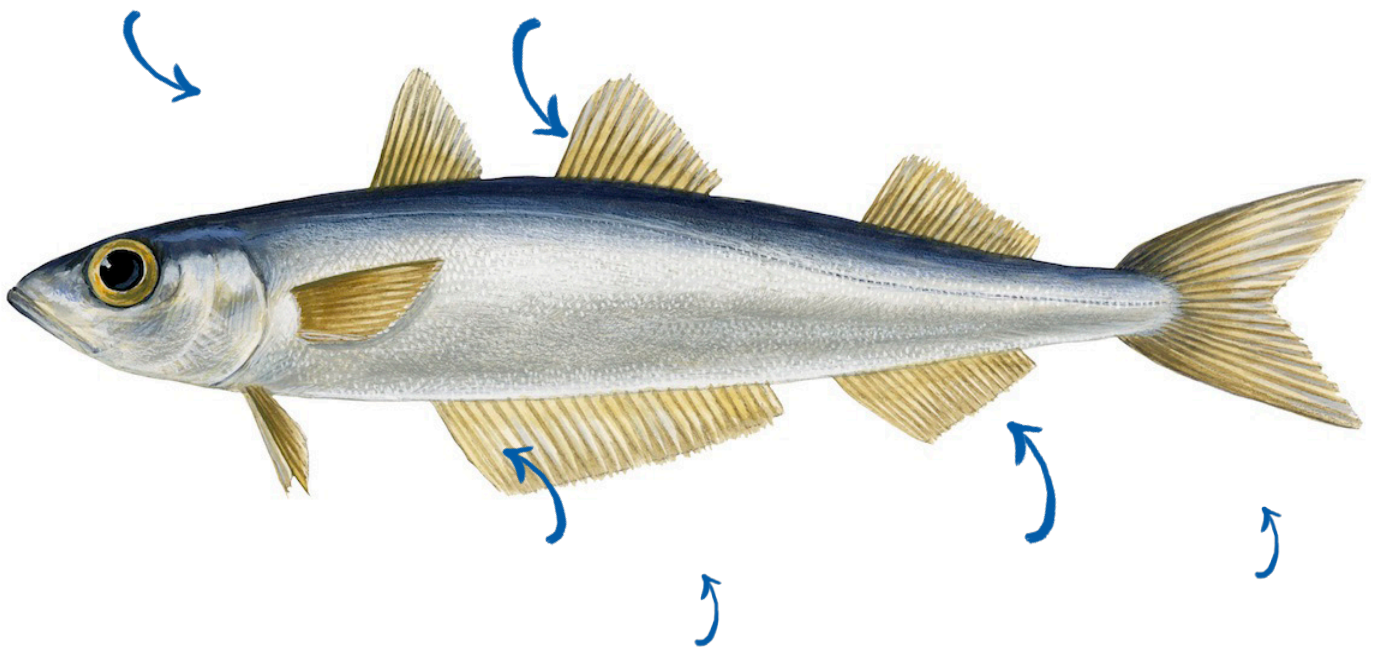




## Exercise 1

Work in pairs to label the fins on this fish. Use information from the fact sheet.

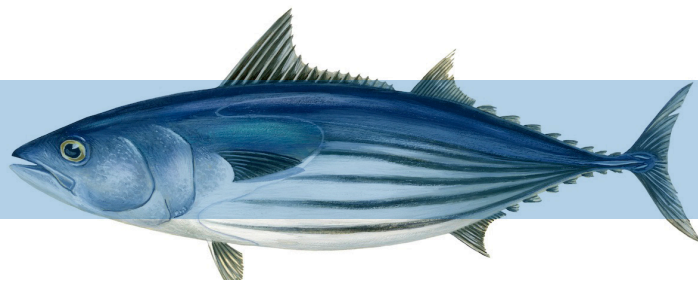
**Dorsal fins / Pectoral fin / Anal fin / Pelvic fin / Claudal fin / Lateral line**  
Can you also label the eyes, gills and mouth?



## Exercise 2

Which of the following do fish NOT have?

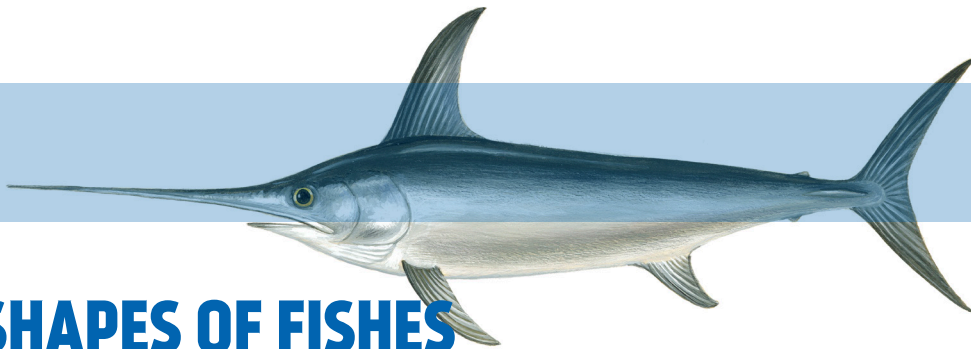
1. Bony or cartilaginous (sharks and rays) skeletons
2. Gills (instead of lungs)
3. Gas filled swim bladders (buoyancy)
4. Fins (steering, moving forward & back, stability)
5. Sometimes colourful bodies (camouflage)
6. Warm blooded bodies
7. Body shape, mouth & eyes to suit habitat & lifestyle



### Exercise 3 - Fishy Factsheet Questions

1. Fish take water through their mouths and their \_\_\_\_\_ extract oxygen from the water around them.
  - a) Gills
  - b) Lungs
  - c) Legs
  - d) Eyes
  
2. Fish are usually covered in \_\_\_\_\_ that have a layer of slime over them. This helps their movement through the water.
  - a) Skin
  - b) Furry flaps
  - c) Scales
  - d) Feathers
  
3. \_\_\_\_\_ fins are for steering, balance and braking.
  - a) Caudal or tail
  - b) Pectoral and pelvic
  - c) Dorsal
  - d) Upper
  
4. Most \_\_\_\_\_ shaped fish live in the open water and are excellent swimmers.
  - a) Square
  - b) Flat
  - c) Long and thin
  - d) Torpedo
  
5. The \_\_\_\_\_ on a fish help it to blend in with its surroundings.
  - a) Fins
  - b) Colours and patterns
  - c) Eyes
  - d) Mouth



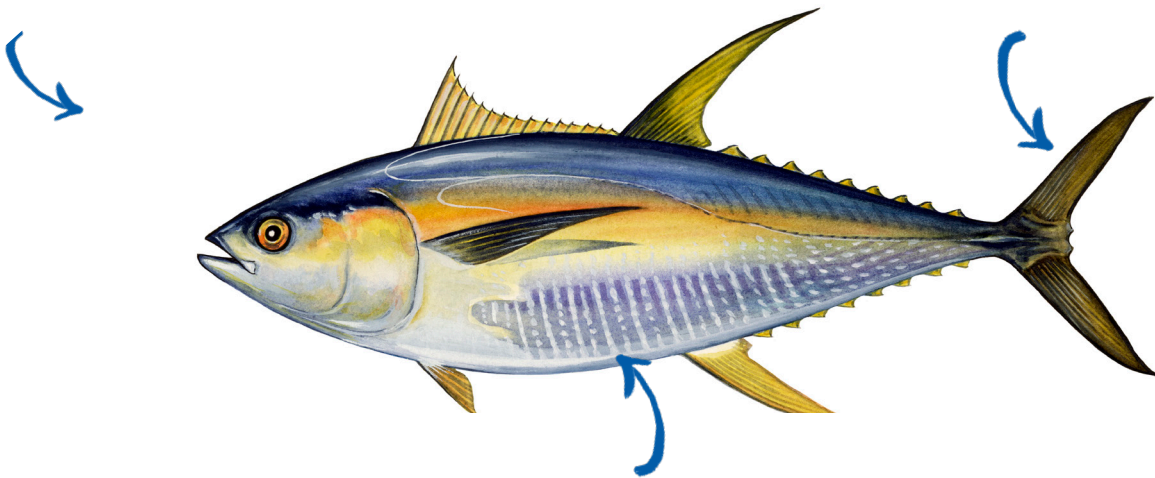


# BODY SHAPES OF FISHES

Adaptation is an evolutionary process (something that happens over time) where a creature becomes well-suited to living in a certain place (habitat). The body shape of a fish gives clues to where and how the fish lives.

**Adaptation 1:** Eyes on either side of head are good for swimming above the sea floor

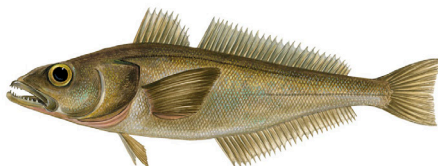
**Adaptation 2:** Torpedo shaped body and forked tail for fast swimming



**Adaptation 3:** Colours (dark on top and light underneath) help camouflage in open water

## Exercise 4

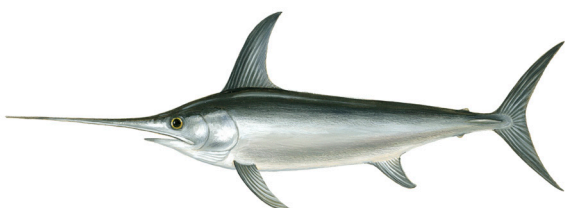
Using the Scientific Key, look at the pictures below and guess which type of fin shape each fish has? All fish are caught by Australian fisheries and are MSC-certified.



1. Patagonian Toothfish



2. Skipjack Tuna



3. Hoki / Blue Grenadier

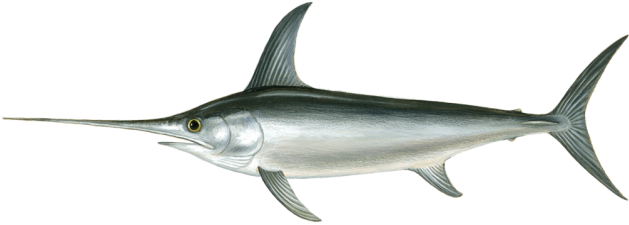


4. Sardine



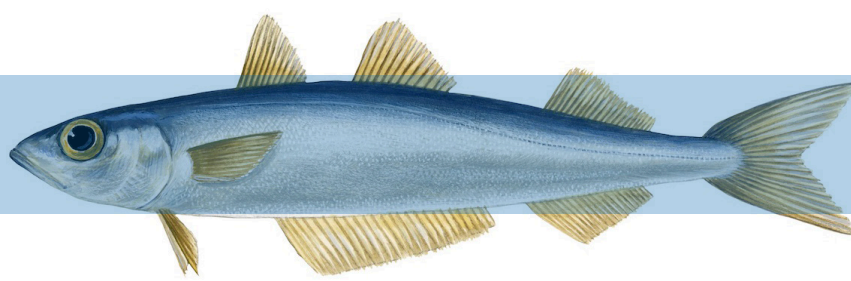


### Exercise 5

<p>1. Swordfish</p> 	<p><b>Habitat:</b> Eyes indicate lives above the bottom, in open water</p> <p><b>Body shape adaptations:</b> Forked tail indicates fast swimmer. Uses its sword to knock prey before eating</p> <p><b>Diet:</b> Small fish and cephalopods (squid or octopus)</p>
<p>2. _____</p>	<p><b>Habitat:</b></p> <p><b>Body shape adaptations:</b></p> <p><b>Diet:</b></p>
<p>3. _____</p>	<p><b>Habitat:</b></p> <p><b>Body shape adaptations:</b></p> <p><b>Diet:</b></p>
<p>4. _____</p>	<p><b>Habitat:</b></p> <p><b>Body shape adaptations:</b></p> <p><b>Diet:</b></p>

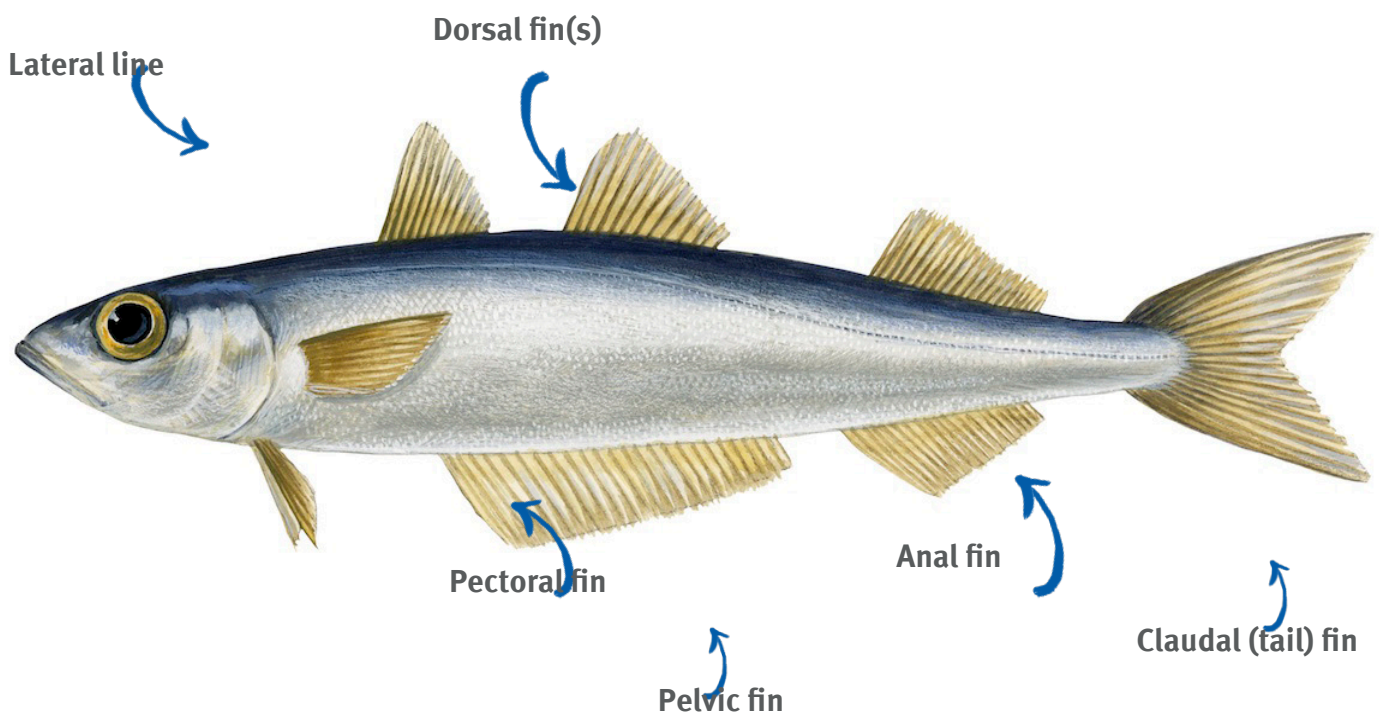






## Answers

### Exercise 1



### Exercise 2

The false statement is 6. Warm blooded bodies - Fish are usually cold blooded.

### Exercise 3

1. Irregular fins
2. Triangular fins
3. Pointy fins
4. Small fins

