

Lesson: Fish Dissection

Phase of learning

Years 7 - 8, Years 9 - 10

WA Curriculum

K-10 Science

Region

North Coast, Gascoyne Coast, West Coast, South Coast, Indian Ocean Territories

Summary

Students will conduct a fish dissection to examine and identify the internal anatomy of a bony fish and learn how these features enable the fish to survive.

Outcomes

- Students will identify external features of a bony fish.
- Students will conduct a fish dissection.
- Students will examine and identify the internal anatomy of a bony fish and learn how these features enable the fish to survive.

Duration

60 - 90 minutes

Preparation

Background information on fish anatomy and fish adaptations can be found in the Fact Sheets: [Fish Anatomy](#) and [Fish Adaptations](#).

This activity may be carried out by students either individually, in pairs, or in small groups (3-4 students).

It is recommended that you carry out a demonstration of the dissection with your class before allowing them to dissect their fish.

There are a number of related resources available to you including Virtual Fish Dissection video, interactive anatomy posters and PDF anatomy posters.

There are two Student Worksheet variations associated with this lesson, depending on your focus for your dissection (external anatomy only or internal and external anatomy). Choose the

worksheet for the species you have chosen or that exhibits a similar body shape to that you have chosen. There is also an associated question sheet (Student Worksheet: [Fish Anatomy](#)) which is applicable to most species of bony fish (optional). You may also find Teacher Resource Sheet: [Bony Fish Anatomy](#) (for your chosen species or similar species) of assistance.

Each student, pair or group will require a fish. Source whole fish specimens from your fish monger. Species that are relatively easy to dissect and determine the internal organs of include:

- Sand or school whiting
- Yellowfin whiting
- Mullet
- Stripey snapper/tropical snapper/brown stripe snapper (no larger than ~22cm)
- Western butterfish
- Striped trumpeters
- Herring

When purchasing your fish, remember to note their name if you are unfamiliar with them.

You can purchase your fish in advance and freeze them, however ensure they are fully defrosted before attempting to dissect them. It is recommended that you keep your fish on ice prior to dissecting them to keep the fish firm.

Each student/pair/group will require a:

- fish to dissect
- Shallow plastic tray, cutting board or mat or newspaper (to protect their work surface)
- pair of sharp, blunt tipped scissors
- pair of sharp, sharp scissors
- pair of sharp tweezers
- pair of blunt tweezers.

Each student will require a:

- Pair of disposable gloves
- Copy of Student Worksheet: [Bony Fish External Anatomy](#) or [Bony Fish Anatomy](#) for your chosen species (or similar species)
- Copy of Student Worksheet: [Fish Anatomy](#) (optional)

For clean-up you will require:

- Warm, soapy water for cleaning trays and dissecting equipment
- Heavy duty bin liners for disposing of dissected fish and disposable gloves – we recommend freezing until bin collection day.
- Surface spray
- Air freshener (optional)

Recommended resources

Poster: Bony fish – [external anatomy](#)

Poster: Bony fish – [internal anatomy](#)

Poster: Bony fish – [external anatomy](#) (thinglink)

Poster: Bony fish – [internal anatomy](#) (thinglink)

Additional resources

Australian Museum, Dissection of a Blue Mackerel, <https://australianmuseum.net.au/dissection-of-a-blue-mackerel-scomber-australasicus>

Australian Museum, Dissection of a Blue-spotted Flathead, <https://australianmuseum.net.au/dissection-of-a-bluespotted-flathead>

Australian Museum, Dissection of a Blue Mackerel (PDF), <https://nkieec.eq.edu.au/Supportandresources/Formsanddocuments/Documents/teacher-resources/Powerpoints/dissection-of-a-blue-mackerel.pdf>

LEARNING AREA	STRAND	SUB-STRAND	CODES
Science	Science Understanding	Biological sciences	ACSSU150 , ACSSU175
	Science Inquiry Skills	Planning and conducting	AC SIS140 , AC SIS165
		Processing and analysing data and information	AC SIS145 , AC SIS170
		Communicating	AC SIS148 , AC SIS174

Steps

Explain to students the purpose of their fish dissection – e.g. identifying external/internal organs; comparing external/internal organs with another species previously dissected; identifying adaptations and their purpose.

Conduct a demonstration of how you would like students to dissect their fish, identifying all of the labelling you wish for students to complete.

Remind students of laboratory safety and safe use of dissection tools.

Distribute equipment and fish to students. Ask students to record the common name of their fish and the total length from the tip of the nose (snout) to the tip of the tail (unstretched, in a relaxed position) on their worksheet.

Examine the external features of the fish, including:

- Dorsal fin
- Lateral line
- Caudal fin
- Anal fin
- Vent (anus)
- Ventral (pelvic) fin
- Pectoral fins
- Operculum
- Mouth
- Nostrils
- Eyes

Points for discussion:

Use the information provided in the Poster: [Bony fish – external anatomy](#) as discussion material for each of the features.

Particular points of interest may be:

- Caudal fin shape and what this tells us about the way the fish moves
- Mouth positioning and shape – use tweezers to pull open the mouth to show how widely it can (or cannot) open. Does the fish have a tongue? Does the species have teeth? What does all of this information tell us about the diet of the fish?

Using the sharp, sharp scissors, cut from the vent in an anterior direction, between the pelvic fins and along the isthmus to the gills to open the gut cavity. Ensure that you don't dig your scissors into your fish too deep or you may damage the contents of the gut cavity.

Identify the gonads, stomach and intestine in the gut cavity of your fish.

Points for discussion:

Use the information provided in the Poster: [Bony fish – internal anatomy](#) as discussion material for each of these features. Particular points of interest may be:

Can you identify if the fish is male or female? Note – you may not be able to if the fish is juvenile or spawned just prior to capture.

Can you identify any of the stomach contents?

Are the findings of the stomach contents consistent with what you earlier determined about the fish's diet based on its mouth shape and positioning?

Remove these organs or pull to the side to expose the swim bladder.

Points for discussion:

Is the swim bladder still intact? If it is, it will appear as an air filled sac.

Explain that swim bladder controls the fish's buoyancy. The amount of gas contained within the bladder is adjusted to allow the fish to move up and down in the water column whilst conserving energy.

Locate the liver, heart and kidney.

Points for discussion:

Use the information provided in the Poster: [Bony fish – internal anatomy](#) as discussion material for each of these organs.

Lift the operculum (gill cover) using tweezers. (optional) Cut and remove the operculum. Carefully (so as to not damage them) remove the gills by cutting through the bone (use sharp, sharp scissors) at either end of the gill arches. Identify the gill rakers and gill filaments.

Place the removed gills into a beaker of water to observe their shape in water.

Points for discussion:

The structure of the gills is made up of three components – the gill filaments, gill arches and the gill rakers. Refer to the Poster: [Bony fish – internal anatomy](#).

What is the purpose of the gill filaments?

What is the advantage of having multiple layers of gill filaments?

Related resources

[Lesson: Fish Dissection - Senior Secondary](#)

[Poster: Bony Fish - External Anatomy \(including information\)](#)

[Poster: Bony Fish - Internal Anatomy \(including information\)](#)

[Student worksheet: Bony fish anatomy - Australian herring](#)

[Student worksheet: Bony fish anatomy - Brown stripe snapper](#)

[Student worksheet: Bony fish anatomy - Painted sweetlips](#)

[Student worksheet: Bony fish anatomy - Trumpeter](#)

[Student worksheet: Bony fish anatomy - Whiting species](#)

[Student worksheet: Fish anatomy](#)

[Teacher Resource Sheet: Bony fish anatomy - Australian herring](#)

[Teacher Resource Sheet: Bony fish anatomy - Brown stripe snapper](#)

[Teacher Resource Sheet: Bony fish anatomy - Painted sweetlips](#)

[Teacher Resource Sheet: Bony fish anatomy - Trumpeter](#)

[Teacher Resource Sheet: Bony fish anatomy - Whiting species](#)

[Video: Fish Dissection](#)

[Fact Sheet: Fish Adaptations](#)

Keywords

fish anatomy, features, adaptations, survival, organs, functions, multicellular organisms, dissection