



Australian Government
Great Barrier Reef
Marine Park Authority

Be a Marine Biologist for a Day



Activity Booklet
Year 10

ANSWERS

How can I help the Great Barrier Reef?

One way I can help the reef is to collect data for the Great Barrier Reef Marine Park Authority (GBRMPA) as a citizen scientist.

I can help to count animals for the Great Barrier Marine Park Authority. They have a citizen science initiative called Eye on the Reef. I can conduct an Eye on the Reef activity on my excursion called a Rapid Monitoring survey. When I conduct a Rapid Monitoring survey on my excursion, I will be counting animals that will help the Great Barrier Reef Marine Park Authority look after and protect them.

The purpose of the Rapid Monitoring survey is to collect information about reef health indicators, protected and iconic species and emerging reef health issues. The Rapid Monitoring survey includes a 10 minute timed swim and a more advanced 360° survey. I will be doing the 10 minute timed swim.

The Great Barrier Reef Marine Park Authority will tell me which animals to count on the Rapid Monitoring survey form (the form is also in this activity book or can be downloaded on the GBRMPA website). There are 10 indicator species to count. I have 10 minutes to count them, swimming slowly in one direction. But I don't need to count them all. I only have to count one (or the ones that my teacher tells me to count), with my buddy pair.

I will record my count on a waterproof tally sheet on a clipboard with a waterproof pencil (either provided by my teacher or the reef guides). I am counting the (animal/name) . When we all finish counting, our Reef Guide will help us pool everyone's data together and show us how to fill in the Rapid Monitoring survey form properly before going back to school.

When we get back to school, my teacher will help us to login to the Great Barrier Reef Marine Park Authority *Eye on the Reef* website so we can let them know how many we all counted.

I can also download the Eye on the Reef app and record what I saw on my excursion. Or I can use it to check out some of the really cool animals I saw!

What is citizen science?

Citizen science is when citizens participate in scientific research.

The Great Barrier Reef is a very big place to monitor.

Data from citizen science helps to monitor and manage the Reef.

The Great Barrier Reef Marine Park Authority (GBRMPA) has a citizen science program called Eye on the Reef.

I will be collecting data for Eye on the Reef during a Rapid Monitoring survey.

The Rapid Monitoring survey includes a 10 minute timed swim.

We will be counting 10 indicator animals over a 10 minute timed swim in one direction. We will be snorkelling on the reef! I am so excited.

We are counting these animals in particular for several reasons. They could be a reef health indicator, endangered, contribute to reef health, iconic, commercially valuable and/or popular with tourists

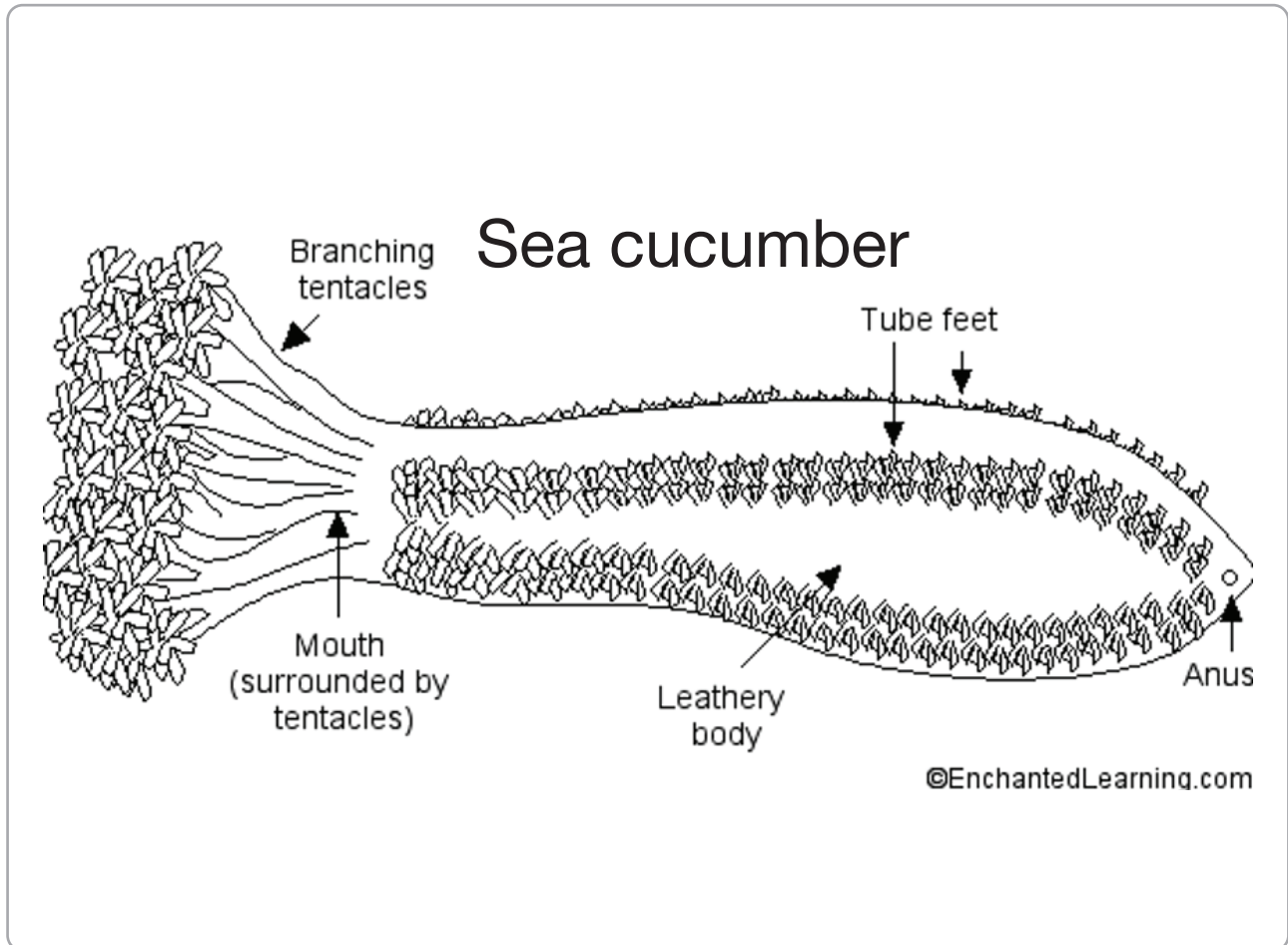
I need to bring this activity book on the excursion. There are lots of questions to answer about the animals we are counting. The questions are very similar to what we are learning this year at school. The Great Barrier Reef Marine Park Authority made sure these activity books aligned with the syllabus for my grade. I am allowed to answer some of the questions before the excursion, some during the excursion and some after the excursion. We get to check all our answers when we get back to school after the excursion. My teacher calls it 'part 3' of the *Be a Marine Biologist for a Day* program. Part 1 is before the excursion, part 2 is during the excursion and part 3 is after the excursion. This activity book is used across all 3 parts.

When I get older, or when I visit the reef again, I will be able to do a Rapid Monitoring survey all on my own because I will know what to do!

I am a citizen scientist and I am helping the Great Barrier Reef!

Sea cucumber

Draw a labelled diagram of a sea cucumber below.



<https://www.enchantedlearning.com/subjects/invertebrates/echinoderm/seacucumber/printout.shtml>

What is the role of DNA in the process of regenerating lost body parts?

Instructions on how to regrow expelled organs is found as code in their DNA.

The code includes instructions for cell migration, proliferation, differentiation and organ/tissue reconstruction.

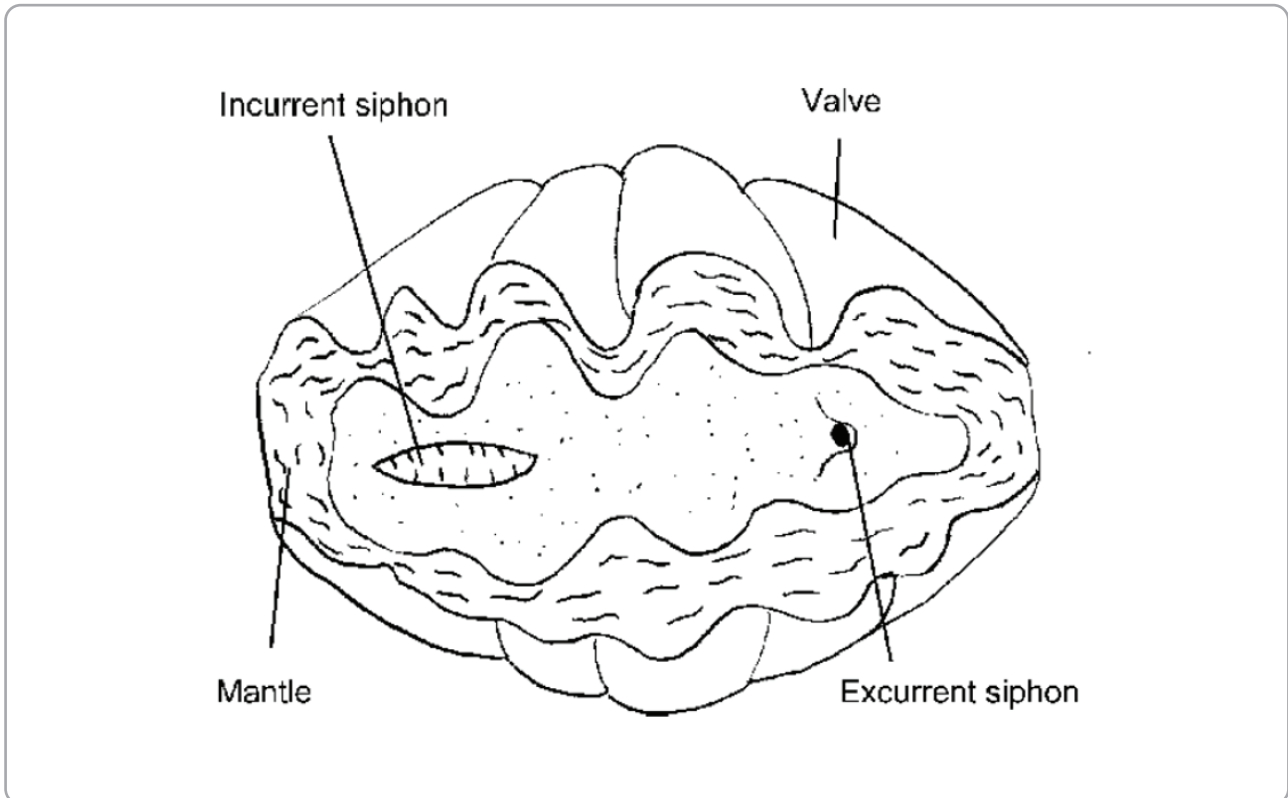
Restoring normal function within 2-3 weeks.

Sea cucumber DNA may hold the secret to alleviate the symptoms of aging through cell and tissue regeneration and organ failure treatment.

Giant clam

>30cm

Draw a labelled diagram of a giant clam in the box below.



<https://meilin5giantclam.wordpress.com/2016/10/20/is-this-i-think-it-is-no-wait-what/>

What causes giant clams to bleach? Explain.

Giant clams (like coral) share a mutualistic symbiotic relationship with an algae called zooxanthellae.

They live in the mantle and carry out photosynthesis. A by-product of photosynthesis is oxygen.

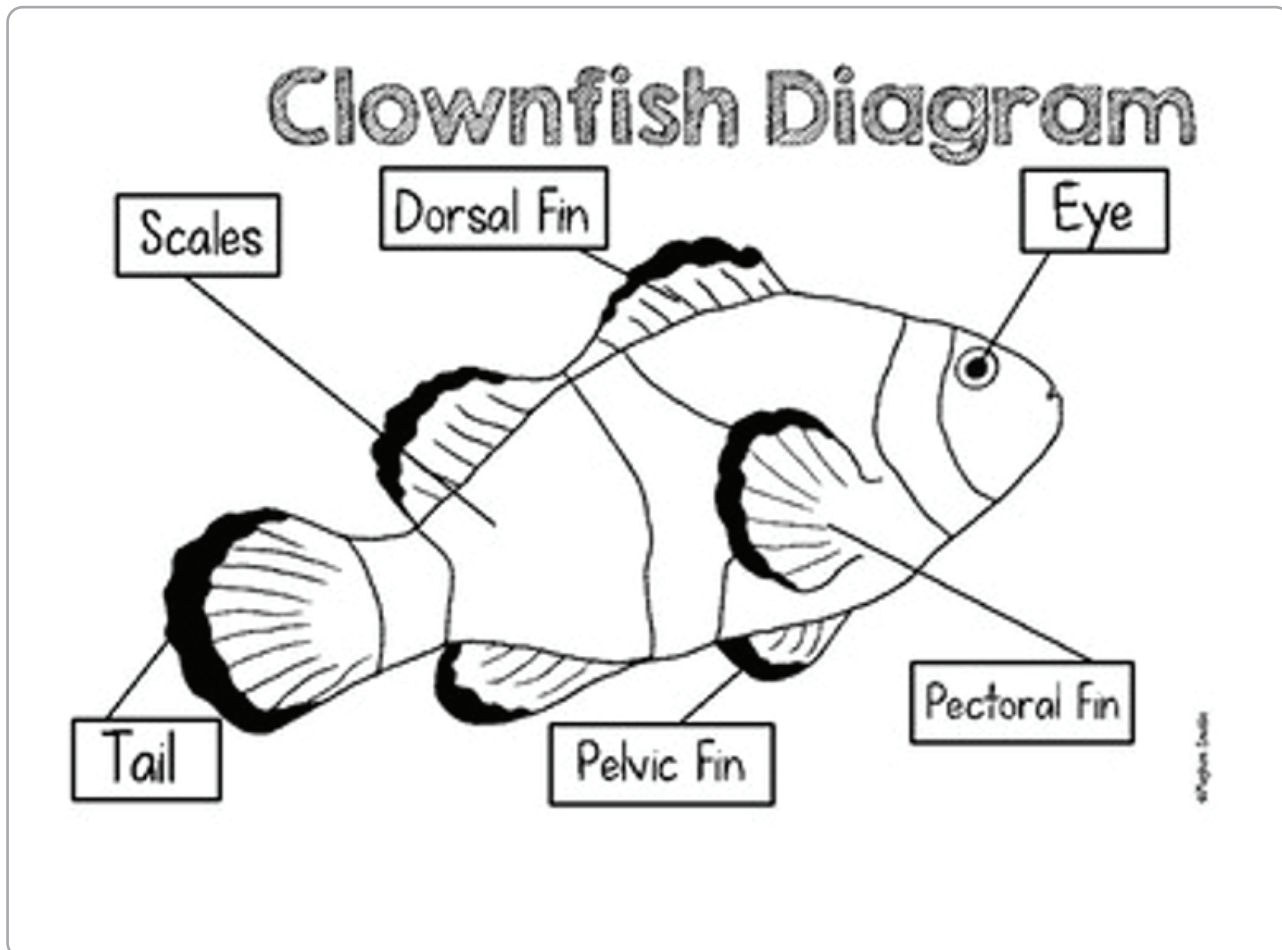
A stress event such as a heat wave causes the zooxanthellae to stress, produce toxic levels of oxygen, and are expelled by the clam.

Without their colourful zooxanthellae, the mantle tissue is transparent. Making the clam appear 'bleached'.

If the temperature cools, and the clam is still alive, the zooxanthellae returns.

Anemonefish

Draw a labelled diagram of an anemonefish below.



<https://www.teacherspayteachers.com/Product/Clownfish-Diagram-Freebie-3134585>

Anemonefish are hermaphrodites. What does this mean?

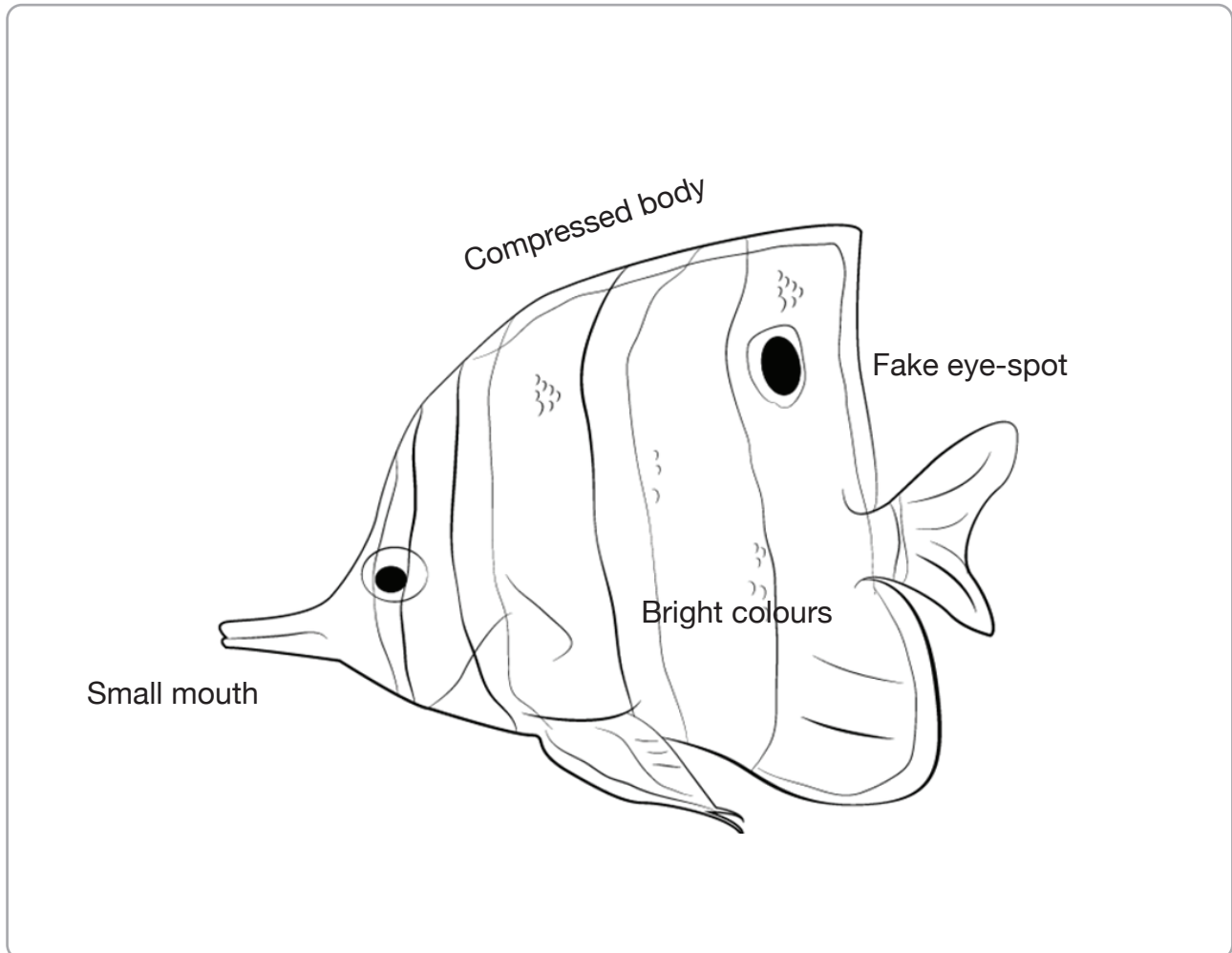
It means they can produce both male and female gametes.

Hermaphroditism is very common in fish.

In the case of anemonefish, the biggest is always the female. All the others are male. The two largest anemonefish are the mating pair. When the female dies, her male partner turns into a female, and the next biggest male takes his place.

Butterflyfish

Draw a labelled diagram of a butterflyfish below.



<https://www.drawingtutorials101.com/how-to-draw-a-butterflyfish>

What is the reason for the fake eyespot?

To avoid predation.

Designed to trick their predators about the location of the head.

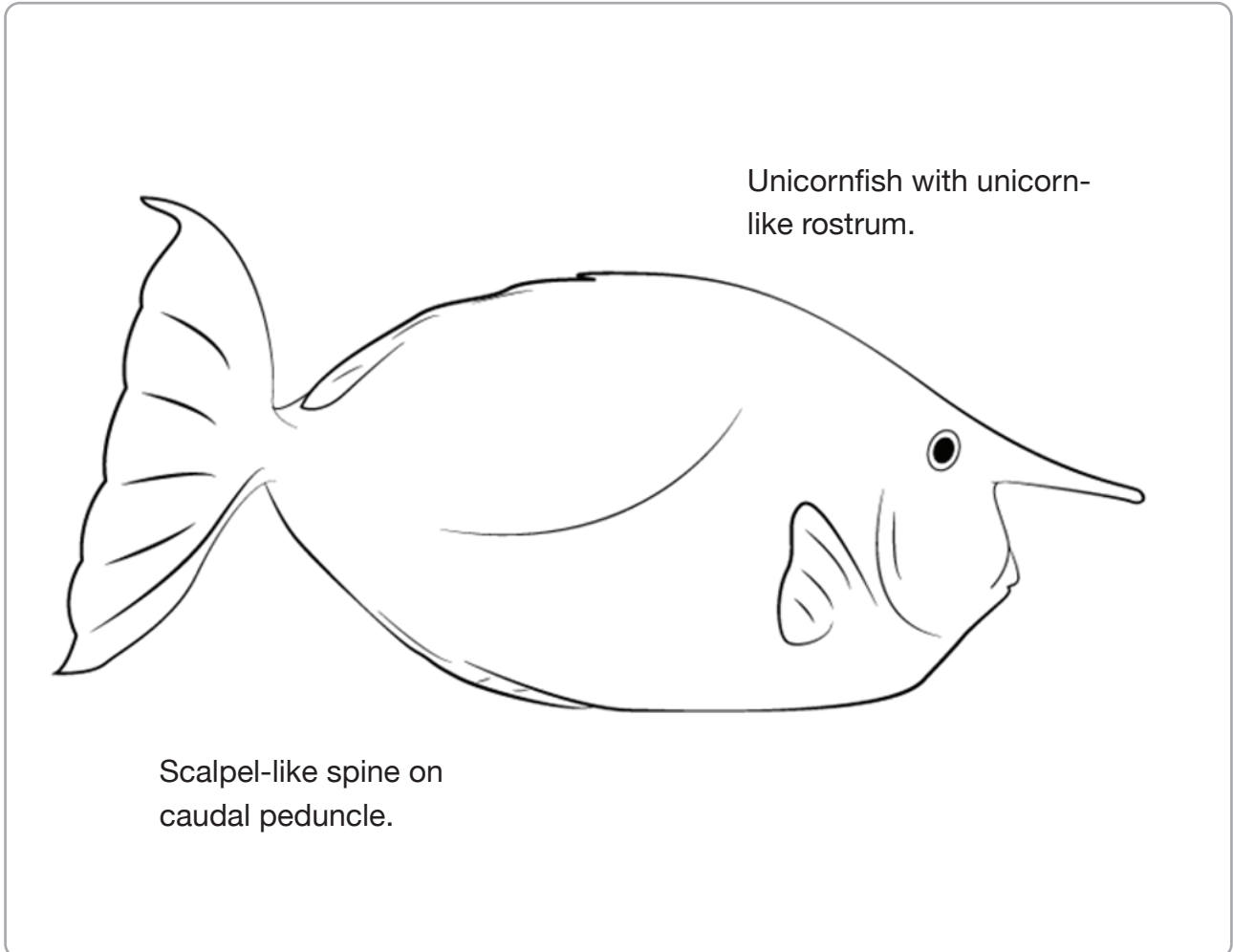
What do butterflyfish eat?

Some eat tiny invertebrates. Or pluck off bits of larger organisms, such as the tube feet of echinoderms. Most feed directly on living coral polyps.

Grazing herbivores

Parrotfish / Surgeonfish / Unicornfish / Rabbitfish

Draw a labelled diagram of a grazing herbivore below.



<https://www.drawingtutorials101.com/how-to-draw-a-whitemargin-unicornfish>

Why is it important to have grazing herbivores?

They keep reefs healthy by eating algae that compete with coral for space.

They are called the 'lawn-mowers of the reef'.

What colour and size is brown macroalgae?

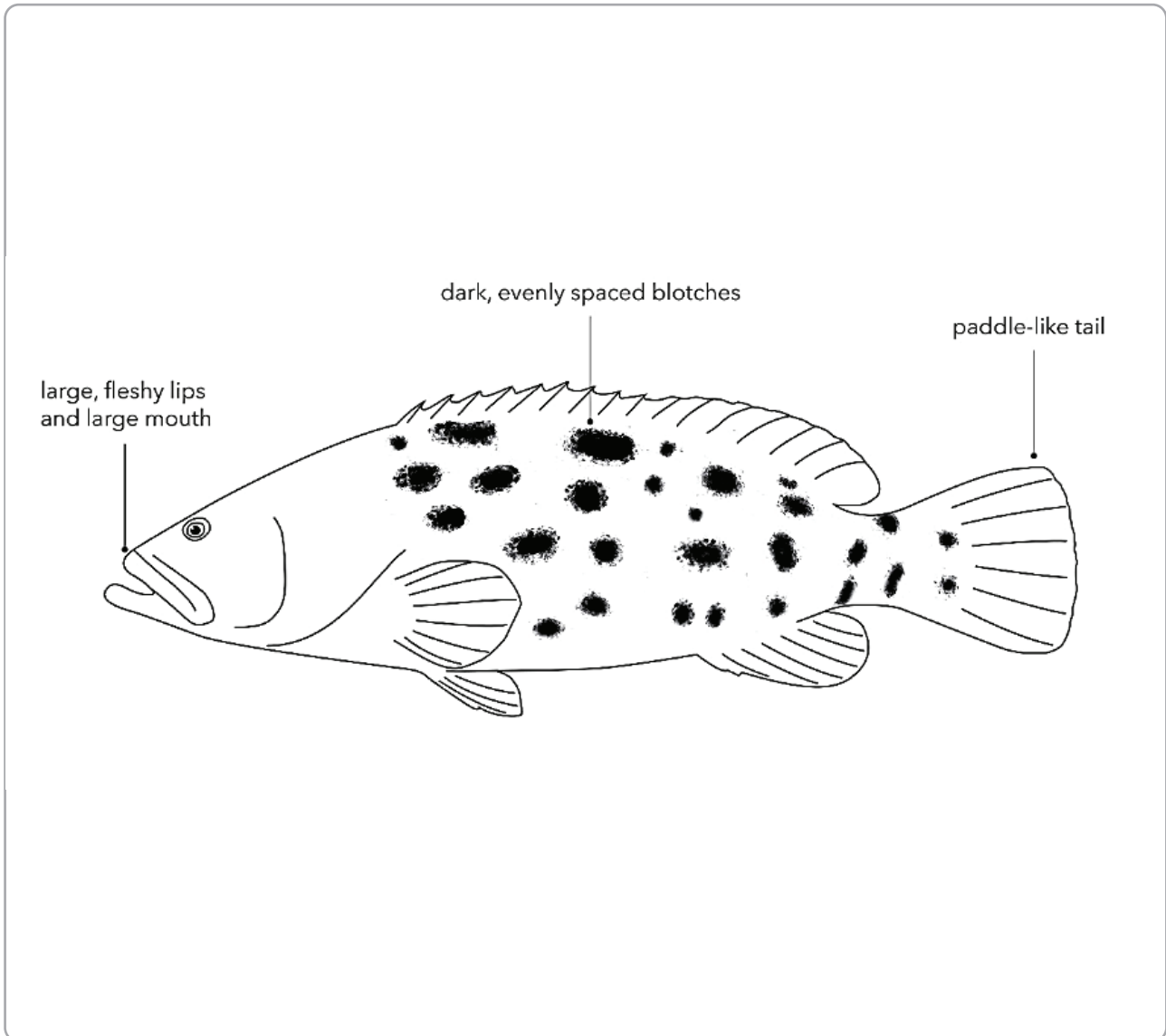
Brown and large.

Macro means 'large'.

Cods and groupers

>50cm

Draw a labelled diagram of a cod or grouper below.



<https://marinewaters.fish.wa.gov.au/resource/potato-cod/>

Are Queensland grouper, potato cod and barramundi cod protected in the Great Barrier Reef Marine Park?

Yes.

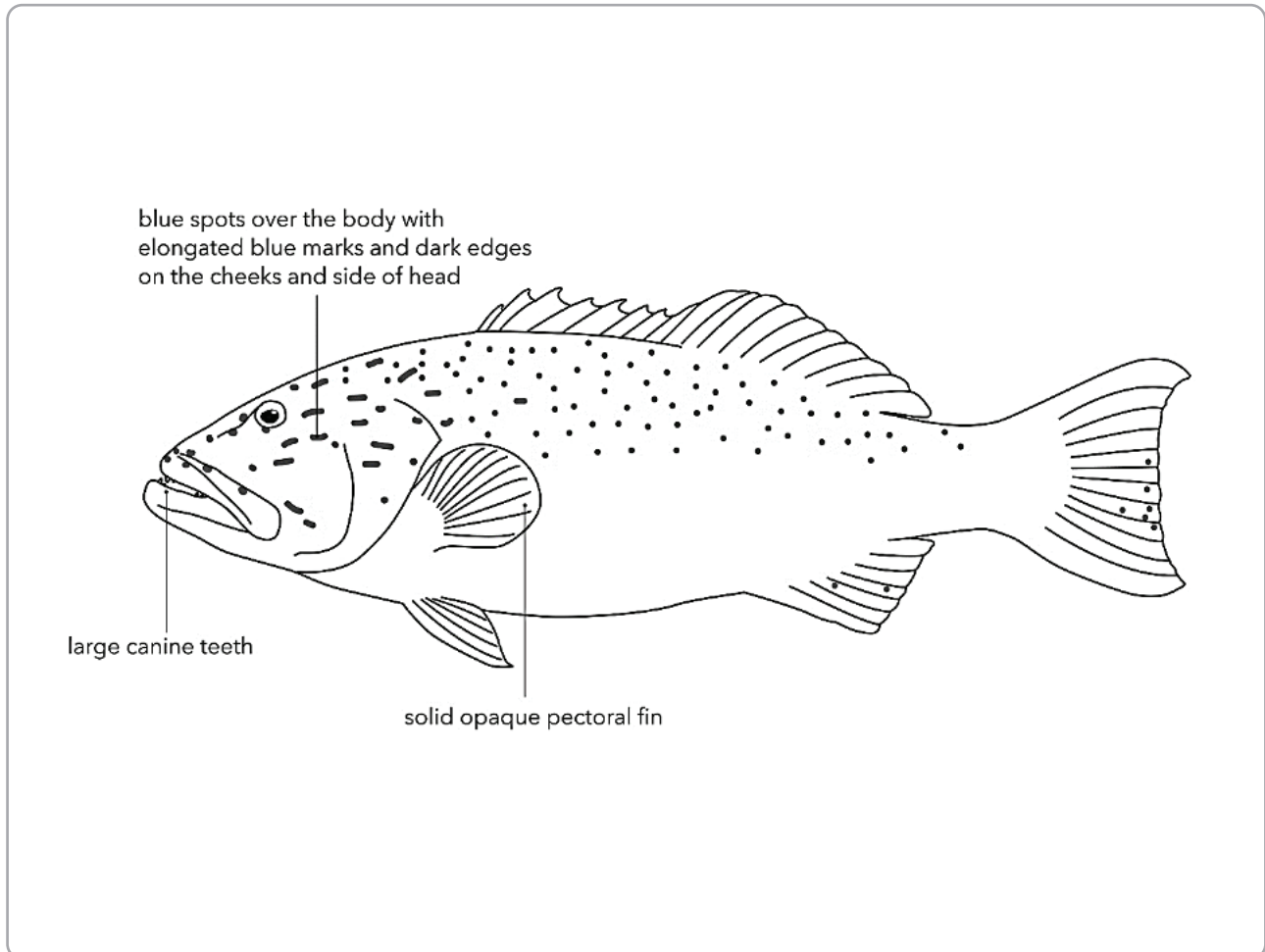
What should you do if you catch one?

Use best practice methods to release it. E.g. avoid lifting into the boat.

Coral trout

<38cm / >38cm

Draw a labelled diagram of a coral trout in the box below.



<https://marinewaters.fish.wa.gov.au/resource/fact-sheet-barcheek-coral-trout-2/>

What is the legal size of a coral trout?

At least 38cm.

What penalties apply for keeping an undersize fish?

Hundreds to thousands of dollars.

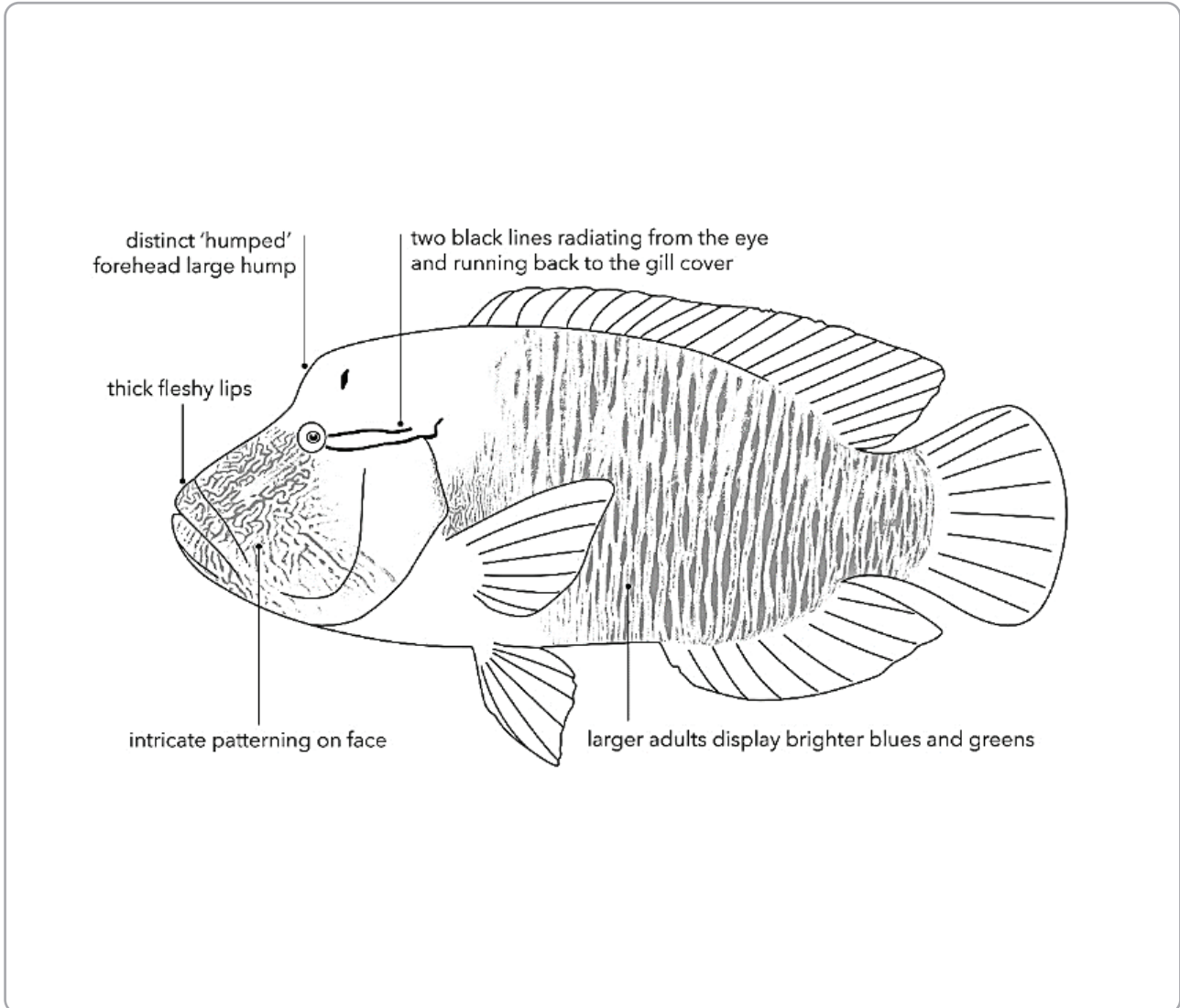
Why is it bad to eat extra large reef fish?

You risk getting very sick with ciguatera poisoning.

Maori wrasse

Male / Female

Draw a labelled diagram of a male Maori wrasse below.



<https://marinewaters.fish.wa.gov.au/resource/humphead-maori-wrasse/>

Where do Maori wrasse live?

Maori wrasse live on the Reef and occupy limited home ranges.

Adults swim across the reefs during the day, resting at night in caves and under coral ledges.

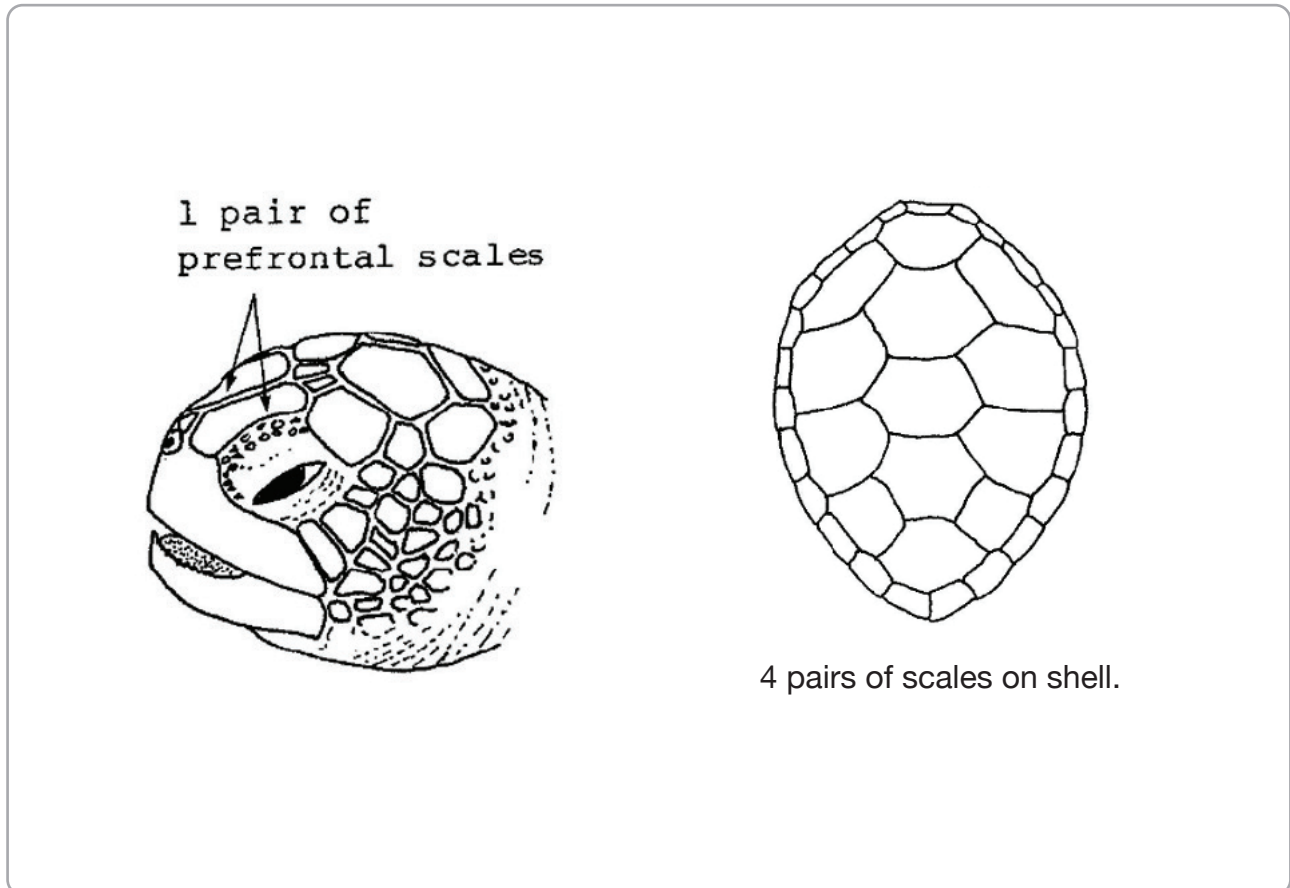
What happens if people touch a Maori wrasse?

It can remove its protective coating of mucus, and they can get sick.

Sea turtles

Green / hawksbill / other

Draw a labelled diagram of a green turtle head and shell.



https://www.researchgate.net/figure/Heads-and-dorsal-carapaces-shells-of-the-Green-and-Hawksbill-turtles-Note-the_fig11_257395050

How many sea turtles are threatened with extinction?

All 6 found on the Great Barrier Reef.

What do sea turtles like to eat that look like jellyfish?

Plastic Bags.

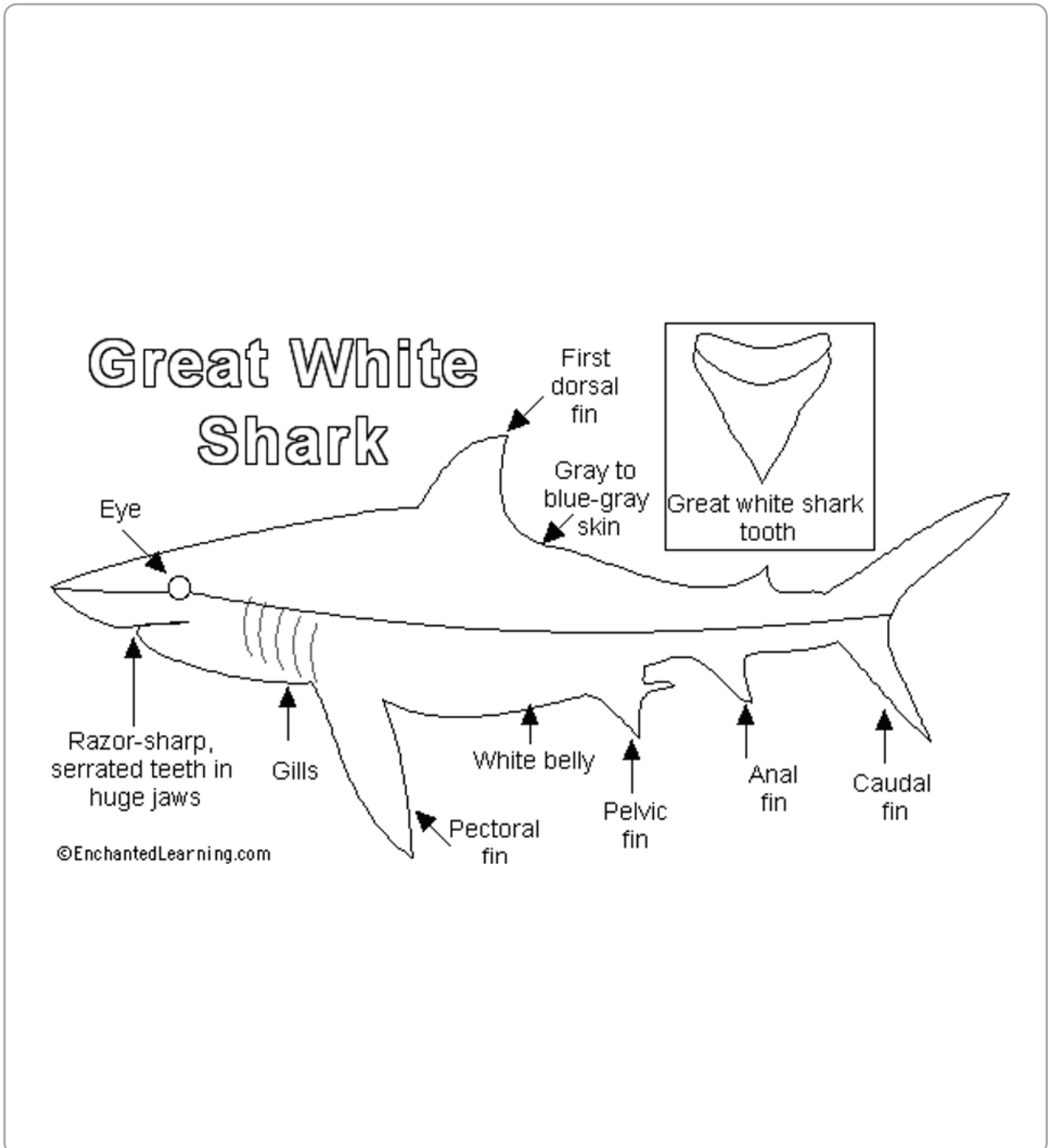
For every kilogram of plankton in the Great Pacific Garbage Patch, how many kg is plastic? 1, 2, 3 or 6kg?

6kg.

Sharks

Whitetip / Blacktip / other

Draw a labelled diagram of a great white shark.



<https://www.enchantedlearning.com/subjects/sharks/classroom/sharktemplates/Gws.shtml>

How many chromosomes does a great white shark have?


41 pairs.

QUIZ ANSWER SHEET


SCORE: _____

Question	Answer	✓×
1		
2		
3		
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30		

Complete this table with your Reef Guide after counting the animals on the reef.



EYE ON THE REEF
EYES REEFERS



Queensland
GOVERNMENT

Marine Park Authority
Queensland Conservation
Coast Service Reef
Marine Park Authority

Rapid Monitoring

Observer name: Phone: Date:

Email: Organisation: Time:

Vessel: Observer category: Reef Marine tourism Fisher Traditional owner
(pick one)

Number of visits to a reef: Survey experience visitor Other
(approximate number of surveys completed) (please specify)

Reef ID (e.g. 16-023): Reef name: Site:

Centre of survey: Lat: S E Long: W Marine Park Zone:
Tick one GPS type (examples over page) Decimal Degrees (preferred) Degrees Min Sec Degrees Min Sec












Survey type (pick one): Snorkel Dive Viewing bucket

Water temperature: °C

Survey depth: metres

Habitat type (circle one)	Flood plume (circle one)	Suspended algal bloom (circle one)	Tide at survey (circle one)	Visibility (circle one)
LAGOON FLAT CREST SLOPE	YES NO	YES NO	LOW MED HIGH	<5m 5-10m >10m

Complete this table with your Reef Guide after counting the animals on the reef.

Timed swim (10 minutes)		See over page for survey methodology				
ANIMALS	TALLY	TOTAL	ANIMALS	SIZE	TALLY	TOTAL
Sea cucumber (all species) 			Coral trout (all species) 	<38cm >38cm		
Giant clam (larger than size of hand) 			Maori wrasse 	SEX Male Female		
Anemonefish (all species) 			Turtle (all species) 	TYPE Green Turtle* Hawksbill Turtle* Other (please name)		
Butterflyfish (all species) 			Shark (all species) 	Whitetip reef shark Blacktip reef shark Other (please name)		
Grazing herbivores See definition over page 			Crown-of-thorns starfish 	Juvenile Adult		
Cods and groupers (over 50cm in length) 						

Complete back at school after your excursion.

***How did I help the
Great Barrier Reef?***

Below, draw a picture or write about your day on the Reef!

A large, empty rectangular box with rounded corners, intended for a student to draw a picture or write about their day on the reef. The box is completely blank and occupies most of the page's vertical space.