SUMMER SEAFOOD - PRAWNS

Teacher resources - Secondary

Recycle me

Australian Curriculum Objectives

Cross-Curriculum Priority - Sustainability

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
- AC9S8U02
  Analyse the relationship between structure and function of cells, tissues and organs in a plant and an animal organ system and explain how these systems enable survival of the individual
- AC9S7H03 / AC9S8H03
  Examine how proposed scientific responses to contemporary issues may impact on society and explore ethical, environmental, social and economic considerations
- AC9S7H04 / AC9S8H04
  Explore the role of science communication in informing individual viewpoints and community policies and regulations
- AC9S7I02 / AC9S8I02
  Plan and conduct reproducible investigations to answer questions and test hypotheses, including identifying variables and assumptions and, as appropriate, recognising and managing risks, considering ethical issues and recognising key considerations regarding heritage sites and artefacts on Country/Place
- AC9S7I06 / AC9S8I06
  Analyse methods, conclusions and claims for assumptions, possible sources of error, conflicting evidence and unanswered questions
- AC9S7I08 / AC9S8I08
  Write and create texts to communicate ideas, findings and arguments for specific purposes and audiences, including selection of appropriate language and text features, using digital tools as appropriate

Years 9 & 10 (Stage 5) - Science

- AC9S9I06 / AC9S10I06
  Assess the validity and reproducibility of methods and evaluate the validity of conclusions and claims, including by identifying assumptions, conflicting evidence and areas of uncertainty
- AC9S9I07 / AC9S10I07
  Construct arguments based on analysis of a variety of evidence to support conclusions or evaluate claims, and consider any ethical issues and cultural protocols associated with accessing, using or citing secondary data or information
- AC9S9H04 / AC9S10H04
  Examine how the values and needs of society influence the focus of scientific research

Years 7 & 8 (Stage 4) - English

- AC9E7LY06
  Plan, create, edit and publish written and multimodal texts, selecting subject matter, and using text structures, language features, literary devices and visual features as appropriate to convey information, ideas and opinions in ways that may be imaginative, reflective, informative, persuasive and/or analytical

In this 45-60 minute lesson for ages 12+ learners will discuss the Australian tradition of eating prawns at Christmas time, and the importance of sourcing sustainable seafood.

Key terms

- Prawn (Shrimp)
- Christmas tradition
- Species
- Anatomy
- Overfishing
- Sustainable fishing
- Consumption

You will need

- 10+ sustainably-sourced prawns for dissection (Science)
- Printed copies of the dissection worksheets pages 6-8 (Science)
- Access to the video Skull Island and Born Free, Caught Wild (English)
- Access to internet - supermarket online store and recipe pages (Maths)

Key questions

- What is a Prawn?
- Where do the prawns we eat at Christmas time come from?
- Can we tell from a dissection whether a prawn is sustainable or not?
- What might the ocean look like in the future if we continue to overfish?
- Is sustainable seafood more expensive?
- How can we ensure that we have sustainably caught prawns in the future?

Class Activities

- Learners the Australian Christmas tradition of eating prawns
- Learners consider the risks that overfishing pose to future seafood supplies
- Learners conduct an anatomical dissection of a prawn
- Learners calculate the cost of a sustainable Christmas seafood lunch
- Learners explore creative writing techniques to reflect on the future of seafood

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CHRISTMAS PRAWNS IN AUSTRALIA

Starter (10-15 mins)

Start the lesson by asking students:

- What Christmas traditions do they have in their families?
- What are the typical foods they eat at Christmas?
- How many people eat prawns at Christmas time?
- Does anyone know what species of prawn they usually eat at Christmas time?

Prawn Consumption in Australia

Australia's yearly prawn consumption is **15 million kg** (15,000 tonnes) of prawns. Approximately **40%** (6 million kg) of these prawns are eaten every **Christmas**.

In 2019, research from the Marine Stewardship Council revealed some interesting facts about prawn consumption in Australia.

- Two thirds of Australians (65%) buy prawns at Christmas time
- Over half of Aussies (56%) believe that Christmas wouldn't be the same without prawns
- Queenslanders are the most likely to eat Christmas prawns, with 71% purchasing prawns at this time of year
- Almost 7 million Australians (42%) who eat prawns are not aware of where their seafood comes from
- **Almost half of Australians (49%) do not know what sustainable prawns are**
- One in four Aussies (25%) cannot differentiate between the species of prawns that they are purchasing

For more details, see the YouGov survey

What does 'sustainable' fishing mean for the Australian prawn industry? Show students the video Australian Wild Prawns - Sustainability (2:09) - created by the Australian commercial prawn industry - and discuss as a class:

- How is prawn fishing regulated in Australia?
  Answers: *Number of boats that can fish, type of gear used, number of prawns caught, technologies to reduce bycatch and wildlife interctions, independent assessments, and Marine Stewardship Coucnil certification of some fisheries*
- Do students think these sustainability measures and practices are effective? Could they be improved?

Note: You may like to watch the video a couple of times, or pause along the way to catch the details.

Main Activity (30-45 mins)

Science

Prawn Dissection

Conduct a dissection activity with your class using sustainably-sourced prawns from a supermarket or other retailer. If possible, you could provide students with two or more different species of prawns to compare.

Students then work in groups to dissect their prawn and complete the worksheet on pages 6-8.

After completing the dissection activity, share some of the Australian prawn consumption statistics (page 3) with students. Discuss, could anyone tell whether the prawn they dissected was sustainable or not? What are some of the **other** ways we can tell if a prawn is sustainable?

Maths & Economics

Sustainable Christmas Lunch

Ask students to design a sustainable prawn Christmas lunch for TEN people using one of the MSC summer Christmas recipes, or one of their own choosing.

Ask students to find an Australian supermarket of their choice which has an online store. Students research the different prawn products available and calculate the following scenarios:

- What is the total cost of all the ingredients for their recipe?
- What is the cost per person to make this dish?
- How many prawns will each guest get if everyone eats prawns?
- How many prawns will each guest get if only seven of the guests eat the dish?
- Three surprise guests show up to Christmas lunch, how many prawns will each guest get now?
- Find an MSC-certified sustainable supplier for your prawns from this list. What is the cost difference of buying a sustainable prawn product?
- What time are your guests arriving? When do you need to start preparing the dish?
- Is it more expensive to buy sustainable prawns?

Share some of the Australian prawn consumption statistics (page 3) with students to reflect on. Consider, **What other types of costs might we have to consider when calculating which prawns to buy?** (eg. social, environmental)

English

Show students this video from a sustainable prawn fishery at Skull Island in the Gulf of Carpenteria, Northern Territory (2:42).

Students write a creative one-paragraph reflection from the perspective of one of the characters as they are shown in the clip.

- The story should be set in present day
- What is this character's connection to the ocean, and to Skull Island?
- How does this character feel about prawn fishing?

Next, ask students to write a second one-paragraph reflection from the perspective of the same characacter. This time, students should imagine a future where, due to overfishing, there are almost no prawns left in the ocean to catch.

- The story should be set in a future without prawns
- What does the ocean look like? What do people eat?
- What is the character's situation now? Where do they live? Do they have a job?

Following this exercise, show students the story Born Free, Caught Wild from the Northern Prawn Fishery which is responsible for catching Skull Island prawns.

Discussion (5 mins)

What can we all do to make sure that we have prawns this Christmas and **every** Christmas into the future?

Extension Activities

1. The Mantis Shrimp
A special species of shrimp found in Queensland's Great Barrier Reef is the Mantis Shrimp. Mantis Shrimp see the ocean environment in a very different way to us. They can detect light that no other living creature we know of can.

Show students this video about the mating rituals of Mantis Shrimp (1:36)

Students can also explore this amazing example of Mantis Vision from David Attenbourough's Reef.

2. Students explore these resources from the Australian Wild Prawns

- A map of Australia's Wild Prawn Fisheries
- A guide to the Prawn Species most commonly fished in Australia
- An interactive 3D or AR experience on board a prawn trawling vessel

Prawn Dissection Activity

(1) Find the scientific classification for your prawn

Common name : _____

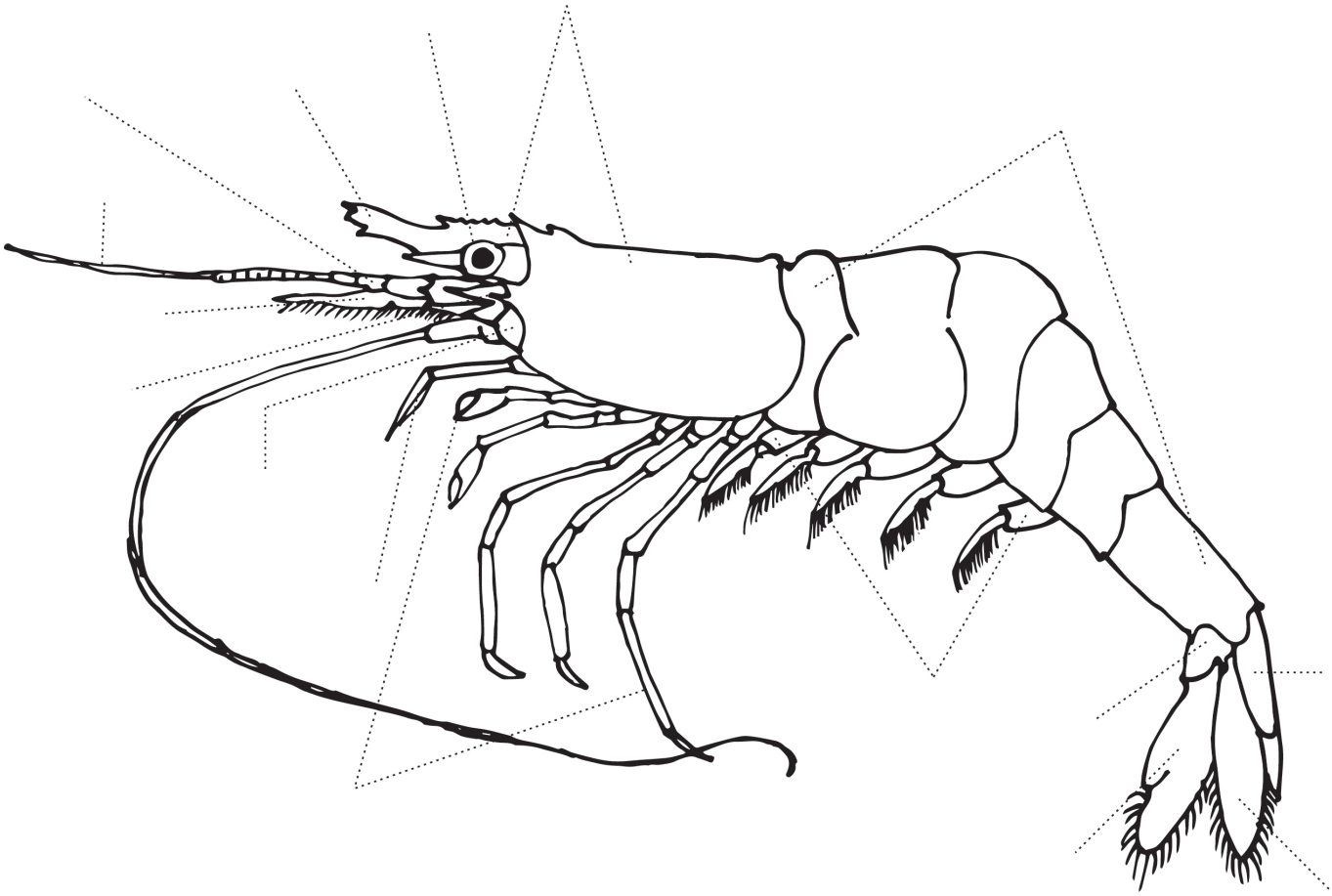
Species name : _____

Scientific name for prawn : _____

Scientific order: _____

(2) Prawn Anatomy

Before cutting your prawn, observe it from the outside and fill in the anatomical labels using scientific terms



Body Parts - Antenna; Antennal spine, Abdominal Segments; Carapace; Exopod; Endopod; Eye; Rostrum; Swimmerets; Telson; Walking legs

(3) Begin your dissection, following the instructions on page 8

Directions for Prawn Dissection

1. Place your prawn on the dissecting tray with it's **dorsal** (back) side facing upwards.

2. Using a sharp knife or scissors, carefully cut under the top of the prawn **carapace** (shell) up the middle of its back to the **rostrum**

4. Cut across the carapace just behind the eyes and remove the two pieces of the carapace. Note and remove the exposed **gills** (feathery structures)

5. Remove the prawn's **legs**, noting the difference between the front legs (walking legs) and back swimmerets

6. Just below the carapace along the prawn's back you will find its **heart**.

7. Remove the heart to find two light colored masses extending on each side of the body into the head. These are the prawn's **digestive glands**.

8. Between the digestive glands, you will find either a small pair of white **reproductive organs** (male) or a large mass of dark colored eggs (female).

9. To locate the **intestine**, insert the point of the scissors under the dorsal side of the shell of the abdomen and cut back to the telson (tail). Spread the shell, and the intestine will be found as a vein on the top side of the muscles of the abdomen. Note the colour of the intestine.

10. Trace the intenstine forwards to the prawn's head is its **stomach** in the front part of the cephalothorax.

10. Now clean out the remaining tissue in the head so that the green glands (**kidneys**) are exposed.

12. In the front part of the head between the eyes you will find the prawn's **brain**. Trace the nerves that connect the brain to the **antennae** and eyes.

14. Spread the shell apart and pull out the large white muscle.

Credit: These directions are adapted from Mr Murray Science class resources

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Questions

(4) Where is the prawn's skeleton?

(5) Which part of the prawn do we eat?

(6) List THREE features of the prawn that might help it to live in an underwater environment

i)

ii)

iii)

(7) Can you tell after dissecting this prawn whether or not it is sustainably caught?

(8) What might be some uses for parts of the prawn that we **do not** eat?

Prawn Body Parts - Answers