Stage 2: A life in the sea, how different can animals be?

Concept:

- Explore the cyclic nature of life and compare the different requirements of marine turtles (reptiles) and humpback whales (mammals).
- Investigate the physical and behavioural adaptations needed by species to survive in the marine environment.
- Understand that the physical condition of the environment plays a vital role in a species' ability to survive.

Student inquiry:

- What is a life cycle? How do life cycles differ between species?
- Do all animals have the same features?
- What physical structures are required to live in the marine environment?
- What is a habitat? What does it provide for a species?
- Why do species depend on more than one habitat?
- What pressures can influence the survival of an animal or the habitat?
- How can you help protect threatened species in Western Australia?

AUSTRALIAN CURRICULUM – SCIENCE		
Year 4	**Year 5**	**Year 6**
Living things have life cycles **(ACSSU072)** Living things depend on each other and the environment to survive. **(ACSSU073)**	Living things have structured features and adaptations that help them survive in their environment. **(ACSSU043)**	The growth and survival of living things are affected by physical conditions of their environment. **(ACSSU094)**

Background information for teachers

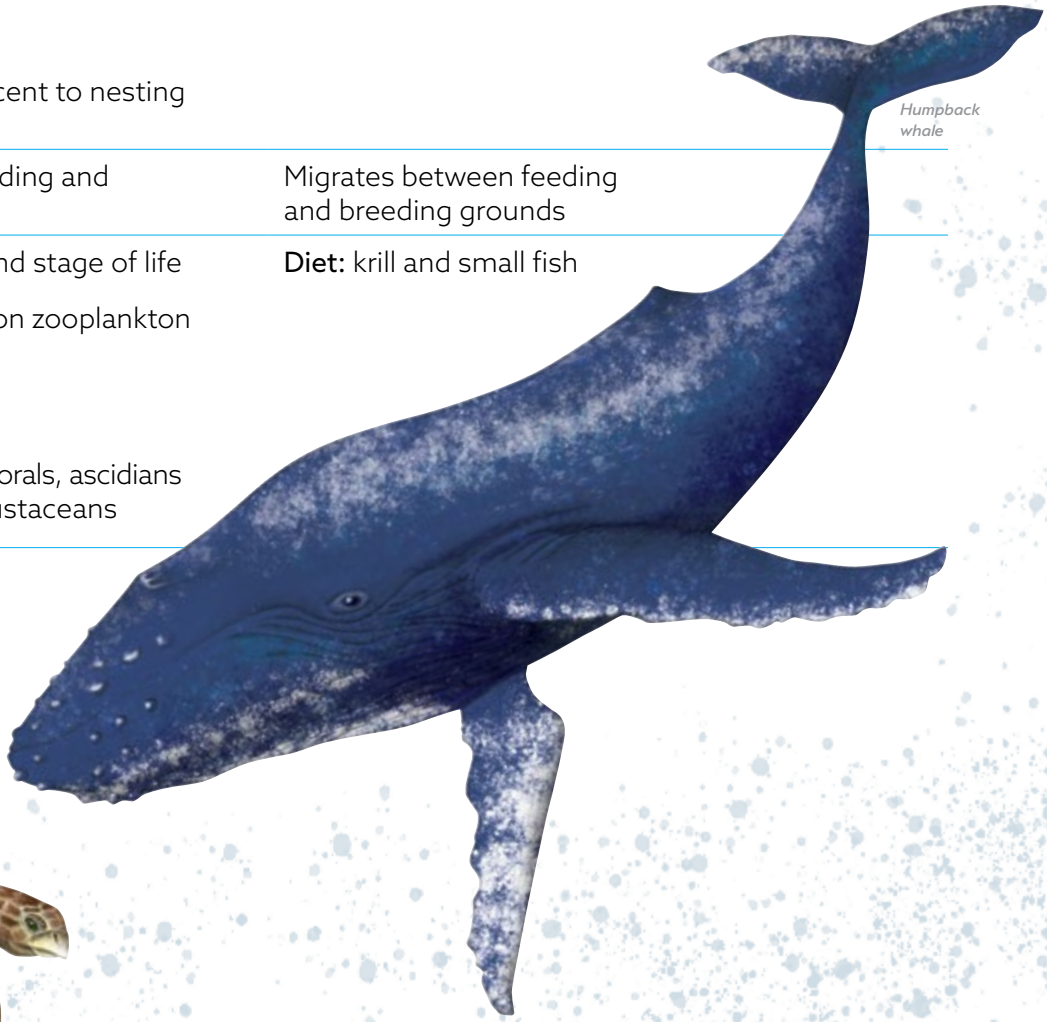
Understanding species requirements

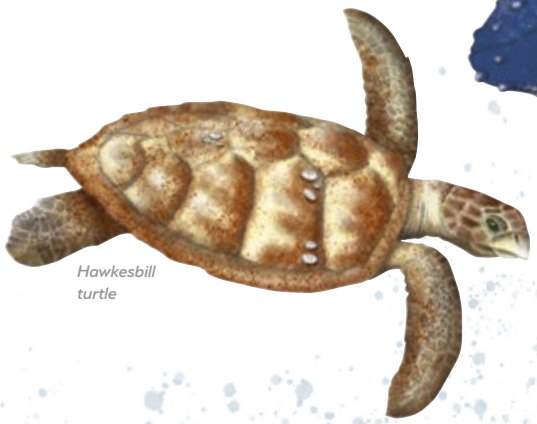
All living things have a life cycle, a series of changes that occur during an organism's life (birth, growth, reproduction and death). Different classes of animals have different life cycles, the stages will vary from one species to another due to life history characteristics (reproductive methods, reproduction rates, number of offspring produced and parental care). As a species progresses through the different life stages they grow and develop in a habitat that meets their requirements to survive. Their needs include a food supply, protection and water. Throughout the stages of life, they may require more than one habitat type. Species develop physical and behavioural adaptations to improve their ability to survive in the conditions of the habitat in which they live in.

Marine turtles (reptiles) and humpback whales (mammals) are good examples of how life cycles, adaptations and habitat requirements can vary between species in the marine environment.

Quick facts

MARINE TURTLES	HUMPBACK WHALES
Reptile	Mammal
Ectothermic – cold blooded	Endothermic – warm blooded
Lay eggs	Give birth to live young
Number of offspring: 50-150 (depending on species)	**Number of offspring:** 1
Parental care: No	**Parental care:** Yes, young suckles from mother for about 11 months
Years to reach sexual maturity: 30-50	**Years to reach sexual maturity:** 4-8
Life span: about 80 years	**Life span:** up to at least 50 years
Has lungs: breathes air	**Has lungs:** breathes air
Habitat: Nesting – tropical and sub-tropical island and mainland beaches Hatchlings/juveniles – open ocean Foraging – coastal waters Breeding – coastal waters adjacent to nesting habitat	**Habitat:** Breeding – warm tropical waters (winter) Feeding – in rich nutrient waters of the Antarctic/Southern Ocean (summer)
Migrate between feeding, breeding and nesting grounds	Migrates between feeding and breeding grounds
Diet: varies between species and stage of life Hatchlings of all species: feed on zooplankton Adults: Greens – Seagrass Flatbacks – cucumber, jellies Hawksbills – sea sponges, soft corals, ascidians Loggerhead – molluscs and crustaceans	**Diet:** krill and small fish


Humpback whale


Hawkesbill turtle

Species vulnerabilities to pressures

Life history characteristics, adaptations and habitat preferences of marine turtles and humpback whales can make them vulnerable to pressures, including human disturbance, vessel movements, coastal developments and climate change. Understanding how species such as marine turtles and humpback whales interact with their habitats during their life stages and identifying pressures that can impact on their survival is essential for working out what management actions will adequately protect the species and habitat critical for their survival.

Teacher directions:

1. As a class, list the different classes of animals (mammals, reptiles, birds, fish, amphibians). Ask the students to identify the differences between them and what they have in common. (Mammals give birth to live young, reptiles are cold blooded, mammals have hair or fur at some stage during their life cycle.)
2. Ask the class to explain what a life cycle is. Brainstorm the different stages of a life cycle. Identify and compare the different stages of mammals and reptiles. Give the students Activity sheet 2.1 and ask them to complete it individually, in groups or as a class.
3. Ask the class to look at the life cycles in Activity sheet 2.1 and brainstorm the different habitats that each species will use during the different life stages. Use different tools such as books, the internet and posters to investigate why species may use different habitats during their life.
4. Give students Activity sheet 2.2 to complete.
5. Discuss with the class the meaning of adaptation. Brainstorm the different adaptions of different marine animals and how those enable them to survive in their environment. Using marine turtles and whales as an example give the students Activity sheet 2.3 and ask them to create a Venn diagram showing the physical and behavioural adaptations. Once completed discuss the answers.
6. As a class, make a list of threats that can impact on the survival of turtles and whales. What threats are naturally occurring or human induced? Do whales and turtles share the same pressures?

Resources:

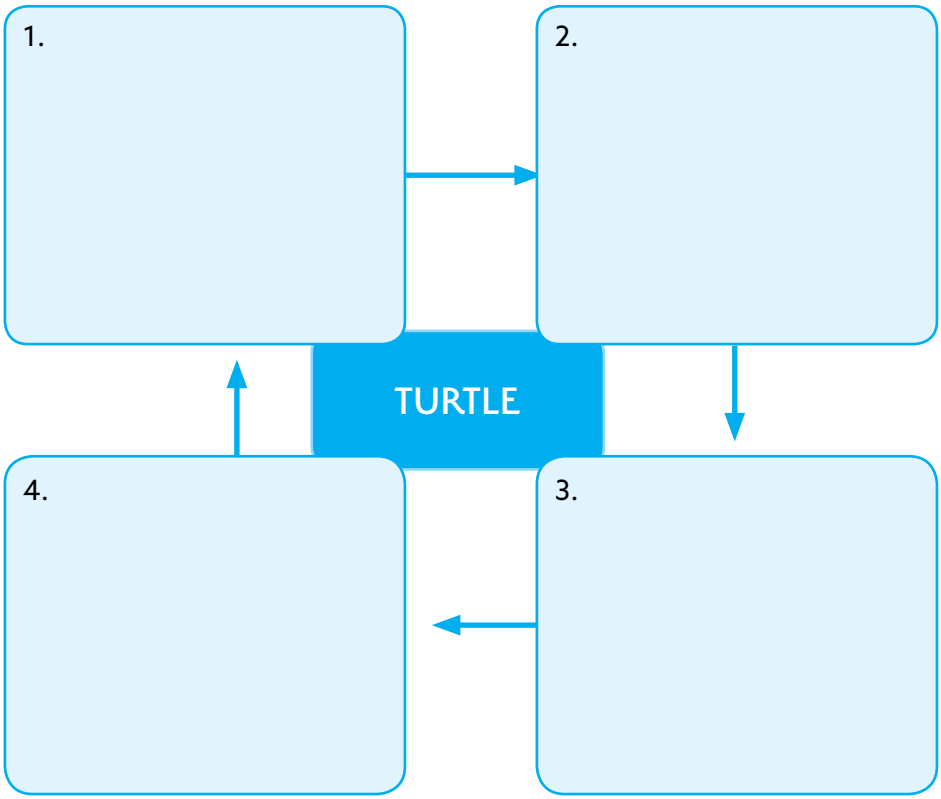
- Resource 1: Species profile Posters 1, 2
- Resource 2: Habitats Poster 5
- Resource 3: Pressures Posters 6

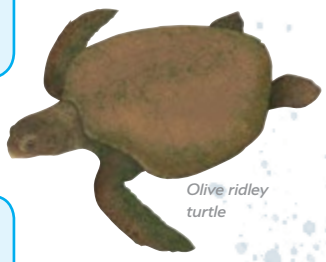
Additional resources:

- Marine wildlife of WA's north-west identification guide
  dpaw.wa.gov.au/images/documents/conservation-management/marine/20170303_marine_life_northwest_finalweb.pdf
- Marine turtles in Western Australia
  dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals/turtles
- Humpback whales
  dpaw.wa.gov.au/management/marine/marine-parks-wa/fun-facts/422-humpback-whale

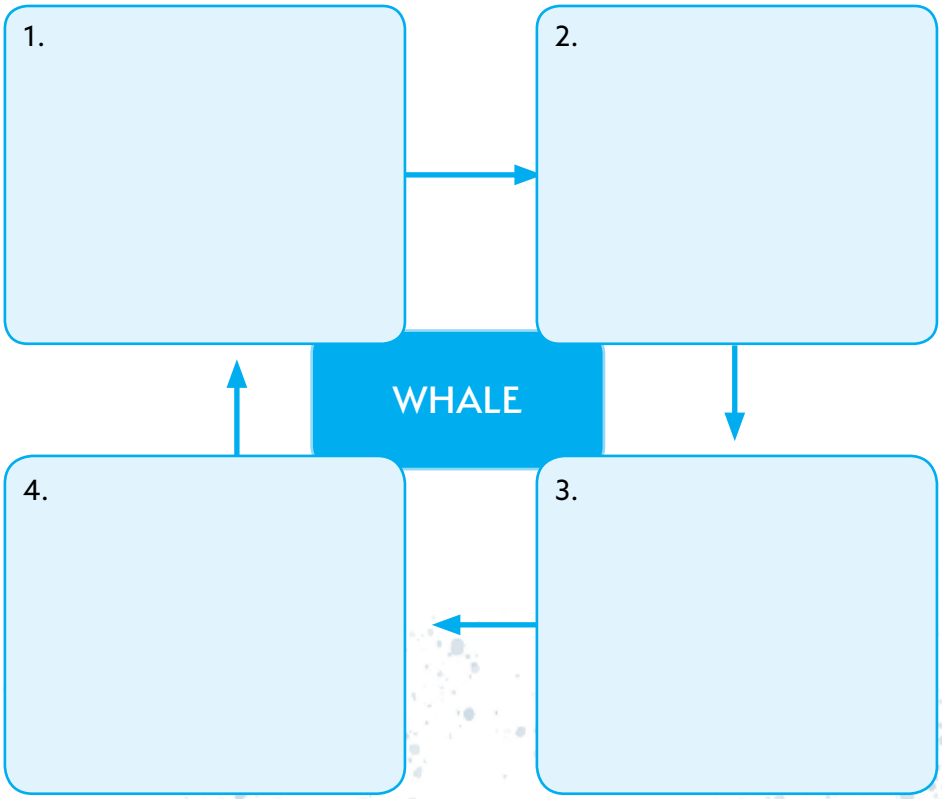
Activity sheet 2.1

Using the pictures below create the life cycles of a turtle and a whale.





Olive ridley turtle



Activity sheet 2.1

Using the pictures below create the life cycles of a turtle and a whale.

Eggs are laid

Rely on mum for food and protection

Drift along with currents

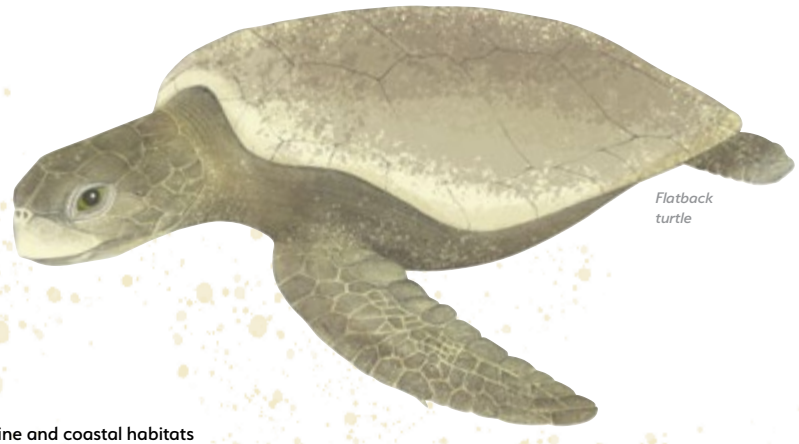
Migrate north to breed

Spend time in the coastal areas feeding

Weigh around 1 tonne

Start mating at 30- 50 years

Not fully mature



Flatback turtle

Activity sheet 2.2

Looking at the life cycle of both turtles and whales from Activity sheet 2.1 can you identify the different habitats that each species will need during their life cycle?

TURTLE		HUMPBACK WHALE	
Life stage	**Habitat**	**Life stage**	**Habitat**
1.		1.	
2.		2.	
3.		3.	
4.		4.	

1. Why do they use different habitats at different stages in their life?

2. What special physical or behavioural adaptation do they have to survive in that habitat?

3. Could a whale and turtle live in the same habitats?

4. List a natural and an anthropogenic (human) pressure that each species may face during each stage of its life cycle.

5. Pick one anthropogenic (human) pressure and describe one action you can take to help reduce a pressure or remove it.

Activity sheet 2.3

Create a Venn diagram by listing as many physical and behavioural adaptions you can think of that help turtles and whales survive in their environment. Can you think of any they share?