



Soneva

Academy

In collaboration with



**OLIVE RIDLEY
PROJECT**



Lessons from the Maldives

Sea Turtles

LESSON: Sea Turtles

AGE RANGE: 8-14 years old (KS2 and KS3)

TIME: 1-2 hours

CURRICULUM LINKS:

Science - Upper KS2 (Year 5 and 6)

Living Things and Their Habitats

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
- describe the life process of reproduction in some plants and animals.
- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.
- give reasons for classifying plants and animals based on specific characteristics.

Working Scientifically

- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- identifying scientific evidence that has been used to support or refute ideas or arguments.

Animals, including humans

- understanding food chains and food webs, predators and prey.

Science - KS3

Biology

Interactions and interdependencies

Relationships in an ecosystem

- the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops.
- how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

LESSON OVERVIEW:

This lesson focuses on the basic characteristics, life cycle and sexual reproduction of sea turtles and their importance within their ecosystem. We also discover the difference between sea turtles, tortoises and terrapins, look at the threats sea turtles face and the conservation efforts to help many endangered species.

KEY VOCABULARY: Vertebrate, Reptile, Habitat, Ecosystem, Life cycle, Sexual reproduction, Endangered, Conservation

POWERPOINT PRESENTATION

Slides 1 and 2 introduce the lesson and lesson aims.

Slides 3 to 7 look at the taxonomy of turtles and that they are vertebrates and reptiles.

Slides 8 and 9 identify the different types of turtles, including tortoises, terrapins and sea turtles.

Slides 10 and 11 focus on the different species of sea turtles.

Slides 12 to 18 explore the anatomy of the sea turtle.

Slides 19 to 29 look at the sea turtle lifecycle.

Slides 30 to 37 delve deeper into the different species of sea turtles, including their diets, habitats and distribution across our oceans.

Slides 38 and 39 specifically look at the sea turtles found in the Maldives.

Slides 40 to 42 look at sea turtles in the food chain and their importance as a keystone species within their ecosystem.

Slides 43 to 47 identify the human threats to sea turtles and includes the International Union for Conservation of Nature (IUCN) Red List, showing the endangered status of many sea turtles.

Slides 48 to 51 show the sea turtle conservation initiatives that are currently happening at Soneva in the Maldives.

Slides 52 to 55 conclude by giving examples of how we can help with the sea turtle conservation efforts, and include activities linked to the lesson.

Supporting
Activity
Available

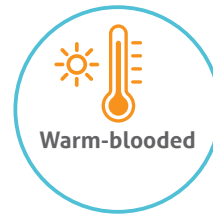
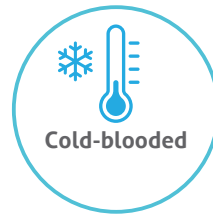
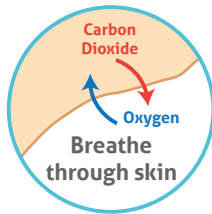
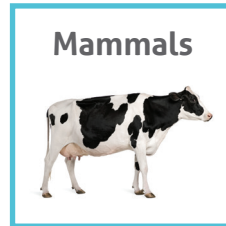
This graphic on the classroom PowerPoint presentation slide, highlights a corresponding activity within these teacher's notes.

Which Characteristics?

Activity: PowerPoint slides 6-7

Which of these characteristics belong to these five classes of animals?
A characteristic can fit multiple classes of animals.

Draw a line between the animals and their characteristics

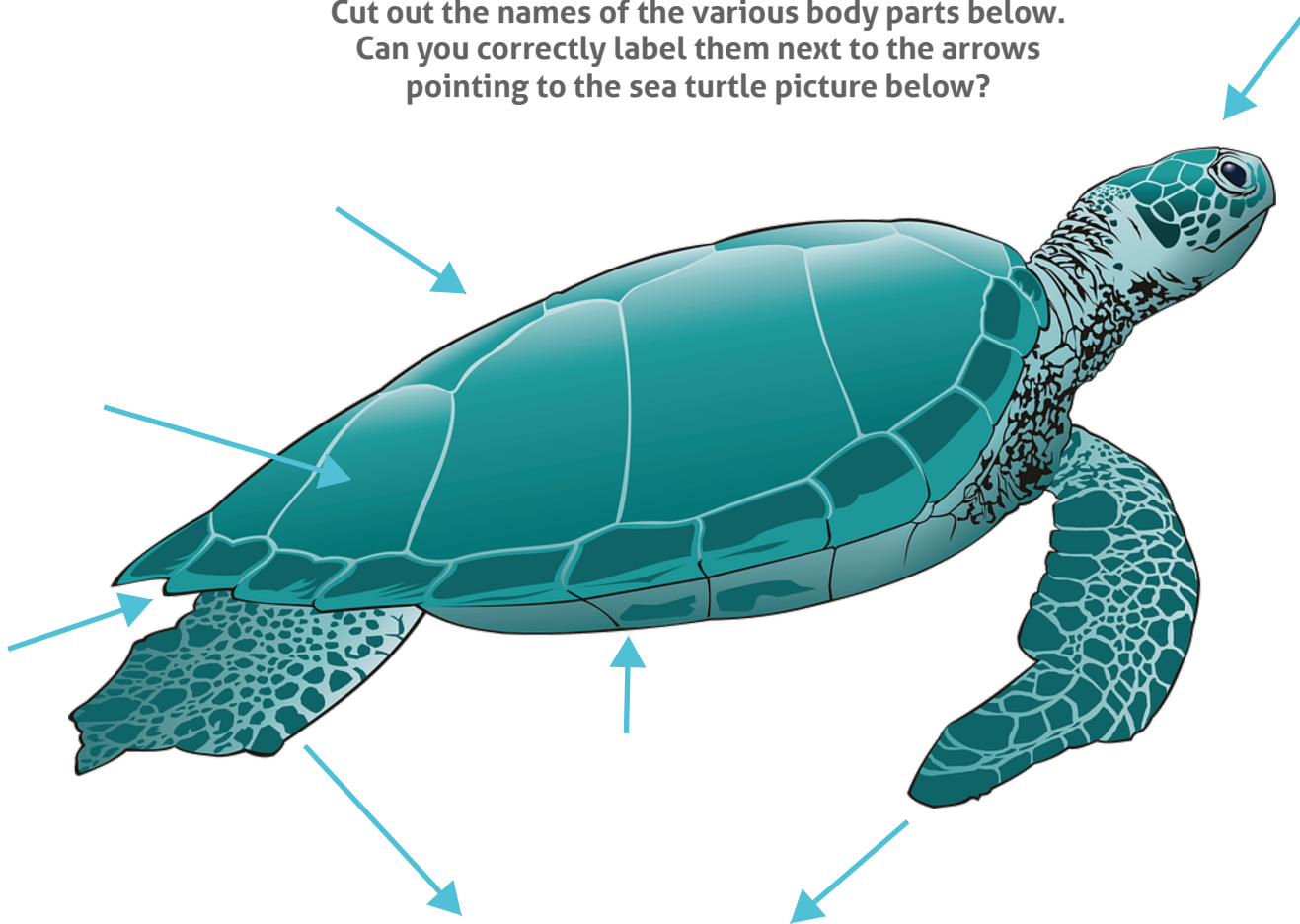


Can you name the characteristics sea turtles have?

Sea Turtle Anatomy

Activity: PowerPoint slide 12

Cut out the names of the various body parts below.
Can you correctly label them next to the arrows pointing to the sea turtle picture below?



Head

Flippers

Carapace

Plastron

Scute

Tail

Sea Turtle Sexual Reproduction

Supporting Information: PowerPoint slide 24

Reproduction:

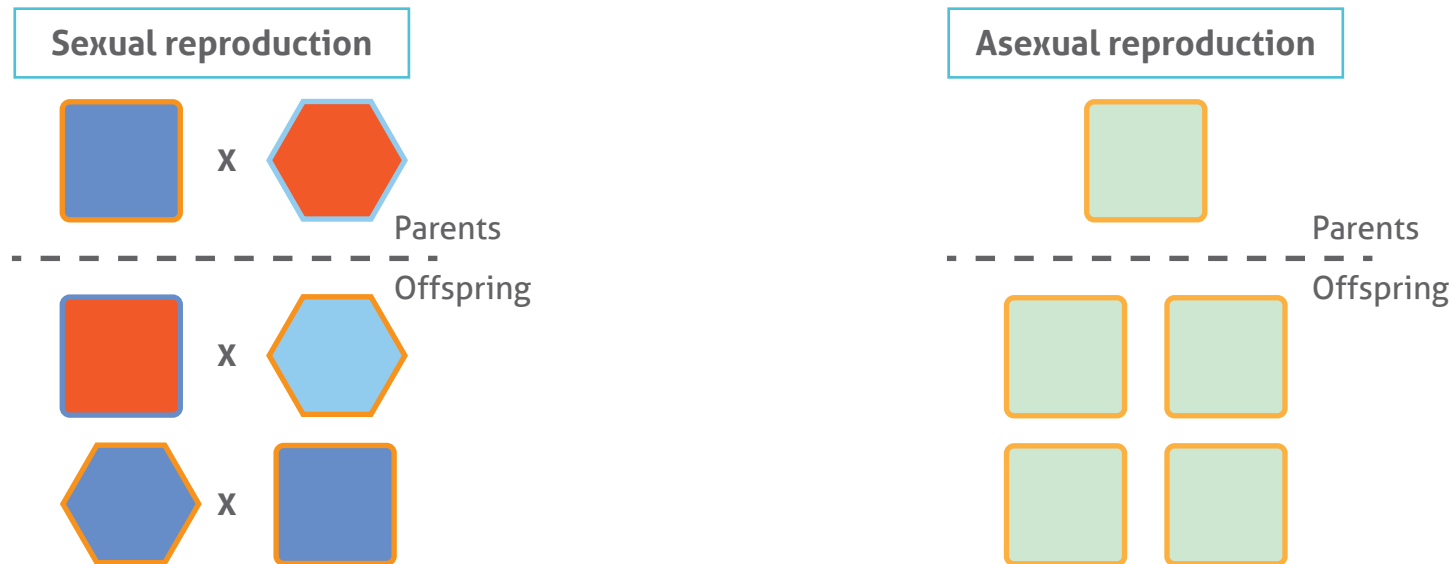
In Biology, reproduction is the production of offspring. You can see it as organisms replicating (making a copy) of themselves. There are two main ways to do this: sexually and asexually. Some organisms can even reproduce in both ways!

Sexual reproduction:

In sexual reproduction the genetic information from two individuals (a male and a female) is mixed. This results in offspring that is different from the parents and genetically unique.

Asexual reproduction

One parent copies itself. It forms offspring that is genetically identical to the parent and to each other. There are various different forms of asexual reproduction.



Human Treats to Sea Turtles

Supporting Information: PowerPoint slide 45

Unfortunately, sea turtles face many threats due to humans. These include the following:-



Plastic pollution

Plastic and other types of waste enter the ocean in different ways, directly or indirectly. This pollution can seriously harm sea turtles. If they get entangled, they can get severely injured or even drown (as they need to come up to the surface to breathe). Sea turtles can also swallow rubbish thinking it is food and starve or suffocate as a result.



Light pollution

Sea turtles prefer to lay their eggs on dark beaches, to avoid predators. However, these are becoming harder to find due to the amount of artificial lighting from buildings, streetlights and other sources. This means an expectant mother turtle will lay her eggs in a nest that is less-than-optimal. In addition, artificial lighting can cause hatchlings to be disorientated as they are believed to follow the brightest horizon, which is normally the ocean that reflects moonlight. If they mistake artificial lights for moonlight, hatchlings can start to wander inland and might never reach the ocean.



Boat strikes

Sea turtles are vulnerable to boat and vessel strikes since they are often close to the surface, either to breathe, or to bask, or to forage in shallow water. Boats might find it difficult to see them, or – if they do see them – take action to avoid a collision. Sea turtles can get seriously injured and die if struck by a vessel.



Poaching

Sea turtle meat and eggs are consumed in many coastal communities around the tropics. But don't be mistaken, it was even seen as a delicacy in Europe by the end of the 19th century. Particularly in Great Britain, green turtle soup became popular. Nowadays, some communities still eat sea turtle meat or eggs - illegally or legally - with sea turtles and nests poached for this very reason.

In addition, some sea turtle species, such as the Hawksbill, are poached as their shell is seen as a precious material.



Destructive fishing

Some fishing methods can be very destructive to sea life, including sea turtles. For example, turtles get entangled in ghost nets (which are big nets that are abandoned, lost or discarded at sea), they can get hooked on long lines (which can be kilometers long with thousands of hooks). They can get caught as bycatch, or lose their habitat and food source because it is destroyed by other fishing methods, such as bottom trawling or dynamite fishing



Climate Change

The effects of climate change can be a great danger to sea turtles. If the oceans warm up, ocean currents will change which might disturb the turtle's migration patterns. Sea level rise and stronger storms will erode and destroy their beach habitats, making it difficult to find a suitable place to nest. In addition, a higher temperature of the beach influences the sex of the hatchlings, developing more females and a shortage of males. Rising sea temperatures also effect other marine life, such as corals, which most sea turtle species need to survive.



Invasive species

Invasive species are species of animal or plant that has been introduced to an area where they are not found naturally. Some invasive species can cause harm to sea turtles. For example, rats or domestic dogs that dig up nests and eat the sea turtle eggs.



Pet trade

Some people keep turtles as pets in unsuitable environments. However, in most countries keeping sea turtles as a pet is illegal as all species are listed as endangered by the IUCN.



Construction

Female sea turtles return to the same beach to nest as they were born (often more than 20 years previously). However, due to buildings, sea walls or other construction, the beaches can look different, or there is simply no way to access it anymore, let alone nest. In these cases, nesting females can become disorientated, lost or stuck.

Sea Turtles on the IUCN Red List

Supporting Information: PowerPoint slide 47

The IUCN Red List is a list of threatened species worldwide that was established in 1964 by the International Union for Conservation of Nature (IUCN). This list is a source of information about the global conservation status of animal, fungi and plant species.

The IUCN Red List is an indicator of the health of the world's biodiversity. It includes information about the population size, habitat and the threats to an organism. This information is a tool that can be used to not only inform, but also to catalyze action for biodiversity conservation.

Currently, there are more than 150,300 species on The Red List. This number changes over time, since the IUCN assesses newly recognized species and re-assesses species that are already on the list. Sometimes there is some improvement to see, but sadly, it mostly shows us that the biodiversity overall is declining.

The IUCN Red List divides species into nine categories (stated on IUCN Red List):

NOT EVALUATED	DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED	EXTINCT IN THE WILD	EXTINCT
NE	DD	LC	NT	VU	EN	CR	EW	EX



Not Evaluated

Not Evaluated means that a taxon has not yet been evaluated against the criteria. These species are not published on the IUCN Red List.



Data deficient

This label is given to a taxon when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. The Species might be well known biologically but there is not enough data on its abundance and distribution.



Least Concern

A taxon is of Least Concern when it has been evaluated against the Red List criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened.



Near Threatened

If a taxon is Near Threatened it is close to qualifying for, or is likely to qualify for a threatened category in the near future.



Vulnerable

A taxon that is vulnerable is considered to be facing a high risk of extinction in the wild.



Endangered

A taxon that is endangered is considered to be facing a very high risk of extinction in the wild.



Critically Endangered

A taxon that is critically endangered is considered to be facing an extremely high risk of extinction in the wild.



Extinct in the Wild

A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (a species or population that is exotic integrates into a given ecosystem and is able to spread and reproduce). The label 'Extinct in the Wild' is given if extensive surveys have been conducted in the known or expected habitat for that species, at appropriate times and throughout a proper historic range and have failed to record an individual. The surveys should be done over a timeframe appropriate to the taxon's life cycle and life form.



Extinct

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed extinct when exhaustive surveys in known and/or expected habitat, at appropriate times, throughout its historic range have failed to record an individual. The surveys should be done over a timeframe appropriate to the taxon's life cycle and life form.

Sea Turtle Conservation

Activity: PowerPoint slide 48

Class discussion:

If you were a Marine Biologist conducting research, what do you think you would need to learn about sea turtles in order to protect them?

Think about some of the following:

- where they live
- what they eat – information about their food (how it grows, where it is located etc.)
- how they mate
- what their lifecycle is
- what their migration patterns are

To achieve an improvement in nature conservation, we don't only need biologists and natural scientists. A diversity of different people and professions is needed!

Class question: Can you think of different professions which could/should be involved in protecting sea turtles and why?

See the overview on the next page for some examples. You can use the empty table on the next page for students to fill in themselves.

Overview example:

Profession	How can they help with Sea Turtle conservation?
Politicians	Politicians can introduce new laws and regulations, which can help to protect natural areas and wildlife. These are needed to make harmful activities, such as poaching nests, trading turtle shells or unsustainable fishing illegal.
Lawyer	An (environmental) lawyer makes sure that (environmental) laws are followed. In that way, people who break a law that protects a marine area or an animal like the sea turtle will be punished accordingly.
Rangers	Rangers are people who protect a certain natural protected area and the wildlife that lives there (as well as the people who visit this area). In the Maldives there are certain protected marine areas where rangers make sure tourists obey to the rules and don't disturb animals such as sea turtles.
Economist	Having sufficient money to survive is important for people across the globe. An economist can calculate how much money a certain area (or animal) is 'worth' in terms of money. Economists can show people that they can earn more money by taking tourist on a snorkel trip to see sea turtles than by poaching the sea turtle and selling its shell. Most animals are 'worth more' alive than dead, which is an important realization that helps with nature conservation.
Educators	The famous quote 'We will protect only what we love and we will love only what we know' from Baba Dioum shows us how important education is when it comes to nature conservation. Educators can teach and intrigue people about sea turtles and therefore initiate or strengthen the will of people to protect them.
Fisherman	As a fisherman you can have a big impact on marine life, including sea turtles. By choosing to fish in a sustainable way, fisherman can reduce their impact on sea turtles.
Hoteliers	The hospitality industry – especially establishments close to the shore – has a choice as how to operate their business. Everything that they offer their guests – food & beverages, activities, accommodation – has an impact on the environment. At the same time, tourists often come to a particular destination because of its beautiful natural surroundings. Hoteliers can choose to offer their guests sustainable food and environmentally friendly activities.
No profession	You can have a lot of impact as a volunteer! Volunteers are often essential within the field of nature conservation. The opportunities are endless, from performing surveys, organizing beach clean-ups to raising awareness.

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Sea Turtle Conservation

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Sea Turtles: Keywords Flashcards



Vertebrate

Reptile

Habitat

Ecosystem

Life cycle

**Sexual
reproduction**

Endangered **Conservation**

Vertebrata

Reptile

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Life cycle

Sexual reproduction

Endangered

Conservation