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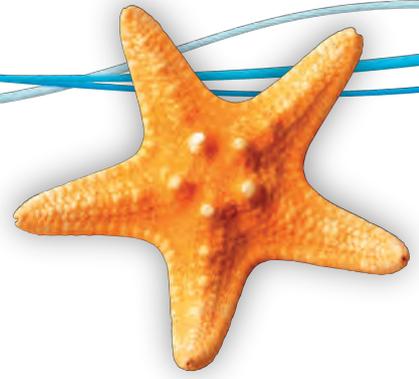
Primary  
Senior Cycle



Teacher's  
Resource Pack  
SESE Curriculum

# Welcome to SEA LIFE's

## Teaching Toolkit



The Amazing Discovery teaching toolkit has been developed with practicing teachers to provide a complete set of tools for a series of stimulating lessons. Amazing Discovery aims to use the exciting variety of animals that live in seas, oceans, and rivers to inspire your students and help them understand a wide range of SESE curriculum topics. Accompanied by a trip to SEA LIFE Aquarium, where students can see, touch, and experience true **WOW** moments, these resources will help you to create Amazing Discoveries for your class.

**The toolkit focuses on science, and covers five key topic areas.**

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**These are:**

- ~ Habitats
- ~ Movement
- ~ Classification and variation
- ~ Food chains
- ~ Adaptation

Conservation and education always have been, and always will be, at the heart of SEA LIFE's work. This resource highlights the importance of marine welfare, drawing out conservation messages in all the relevant topic areas. A trip to SEA LIFE Aquarium will help to provide a greater understanding of the conservation issues we face, what SEA LIFE is doing about them, and how every one of us can help.

The resource also supports cross curricular learning, using the sea's creatures as a focus for activities that support Art, Drama, English and Maths, amongst others. These cross curricular opportunities are highlighted for each topic.

**Each topic is supported by the following elements:**

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### Teacher Notes

The notes in this booklet lay out the background information, learning objectives, and cross curricular links for each topic. They also contain activities which can be carried out before, during or after a visit to SEA LIFE Aquarium. Each section also features exciting **WOW** facts to inspire students and teachers alike!

### Student Worksheets

The Student Worksheets contain all of the resources which your students need for each topic's activities. Remember to produce enough copies of the Student Worksheets for every member of the class.

### Power Point Slides

The Power Point Slides contain lots of engaging information and striking pictures to help your students develop their understanding of each area.

# Habitats

Visits to SEA LIFE Aquarium provide the perfect opportunity to introduce your students to the importance of habitats. The activities and information you'll find on the slides will introduce them to the concept of habitats, and help them to understand that habitats have an effect on the animals that live there. Students will gain an understanding of the many different habitats which exist underwater; from freshwater to saltwater, coral to riverbank.

## Resources provided

- Student Worksheet 1-2
- Habitats Power Point slides

## Before & After activities

### Activity 1: Creature Quiz

- Using slides 1-13 to introduce students to the topic of habitats.
- Hand out Student Worksheet 1 and use slides 14-17 to present a quiz to your students.
- For each question present your students with three statements from the relevant slide.
- Students have to choose which of the four creatures on their quiz sheet the statement applies to.
- Finally students could work out what links all of the different creatures. Display slide 18 which explains what a tide pool is.
- Students could be asked to choose one of the animals featured in the quiz, and write a short story about that animal and its tide pool friends.
- Able students could write their own creature quiz for the creatures that interest them most.

#### Resources:

- Slides 1-18
- Student Worksheet 1

### Activity 2: Describe the Habitat

- Ask students to look at the image of a coral habitat on Student Worksheet 2.
- Using the guidelines provided, ask students to write a brief description of the habitat.

#### Resources:

- Student Worksheet 2

### Activity 3: The Perfect Habitat

- Students could write or draw a description of their perfect habitat.
- It could be their bedroom, a tent or a swimming pool.
- They could outline their perfect temperature, food and cover as well as any other important conditions.

#### Resources:

- None required

### Activity 4: Habitat Collage

- Ask your students to create a collage of different habitats. They could look through magazines or search on the internet for suitable pictures.
- They could then write down one animal which lives in each of the habitats they have used in their collage.

#### Resources:

- Magazines
- The internet

### Activity 5: Conservation News

- Drawing from the information which they are presented with on slides 19-25, students write a newspaper article describing the destruction of the polar ice caps.
- They could describe the damage that is being done to the environment, and the effect it is having on the animals which live there. They could also explain what can be done to help conserve this habitat.
- Students could use a computer to write their article up and design it in the style of a newspaper.
- Students could also create a poster to explain the dangers posed to the polar ice caps.

#### Resources:

- Slides 19-26

## During your visit

- Ask students to note down some of the different freshwater and saltwater animals which they see during their visit.
- Ask students to count how many different species of animals live in the tide pool habitat. They could write a numbered list or try to draw as many different species as possible.
- Tell students to note down differences between two of the habitats provided by SEA LIFE.
- Students could choose one of the different habitats provided by SEA LIFE and draw a picture of it, including some of the different features and the animals which live in it.

## Learning Objectives

- Know what a habitat is and that different habitats can have very different conditions.
- Know that one environment can provide a habitat for lots of animals.
- Know that the conditions in a certain habitat dictate which animals are found there.
- Understand the importance of maintaining habitats for conservation.

## Curriculum Subjects

- Living Things
- Energy & Forces
- Environmental Awareness & Care

## WOW facts!

- Clown fish live on coral reefs, which are one of the most threatened ecosystems on Earth.
- Coral is a living organism which also serves as a habitat.
- Some fish like to live dangerously! The clown fish lives in between the venomous tentacles of the sea anemone to protect itself from other predators.
- The biggest threat to Leatherback Turtles is plastic bags in the ocean. The turtles mistake them for jellyfish and eat them!
- Penguins only live in the Southern Hemisphere.
- Some sea creatures can survive out of water for most of the year. Amazingly the Black Periwinkle lives high up on the beach and may only be touched by seawater once a year during the highest tides.

# Movement

The information contained in the Power Point slides and the activities here will introduce students to the different parts of the body used in movement. Students will discover that sea creatures come in all shapes and sizes; from scuttling and crawling, to swimming and floating, they move in all sorts of ways. A trip to SEA LIFE Arizona will allow students to see the weird and wonderful ways they move in real life!

## Resources provided

- Student Worksheet 3-5
- Habitats Power Point slides

## Before & After activities

### Activity 1: Guess How They Move

- Students look at the pictures on Student Worksheet 3 which show two different animals that live in the sea with key features highlighted.
- As a class brainstorm words which they think could be used to describe how the animal moves.
- Split the class in two and ask each half to write a short paragraph explaining how they think the animal would move and why.
- Discuss as a class.
- Show slides 5-6, which explains how those animals move.
- Ask your students to find the two animals during their visit to SEA LIFE and check whether or not their description was correct.

#### Resources:

- Slides 1-6
- Student Worksheet 3

### Activity 2: Anatomy of a Fish

- Use slides 7-8 which explain how fish move.
- Ask your students to label the diagram of a fish on Student Worksheet 4 using the words in the box next to it.
- Display slide 9 which shows the answers.
- As a class, talk about the different parts which have been labelled. Ask students to explain the role that each part plays in the way a fish moves.

#### Resources:

- Student Worksheet 4
- Slides 7-9

### Activity 3: Different Types of Movement

- Split students into groups of three and assign one of the animals from slide 10 to each group.
- Ask each group to develop a role-play to show how that animal moves.
- Each group should perform their role-play to the class.
- Ask the class to write down some feedback on each performance. They should provide two pieces of positive feedback and one way in which it could be improved.
- Display slides 11-12 which explains the key differences in the ways fish can move.

#### Resources:

- Slide 10-12

### Activity 4: How Fast Can a Fish Swim

- Ask students to look at the information on Student Worksheet 5.
- Tell them to use the information to figure out how far various fish can swim in different amounts of time.

#### Answers

1 360 miles 2 55 miles 3 3.5 hours 4 6 hours 5 45 miles

#### Resources:

- Student Worksheet 5

## During your visit

- Students could draw a picture of two different animals at SEA LIFE. For each drawing they could note down three bullet points to explain how the creature moves.
- Students could draw a picture of one of the animals at SEA LIFE and label the key body parts. They could complete the labelling in class with reference materials to hand.

## Learning objectives

- Know that movement is one of the seven life processes.
- Understand that different animals move in different ways.
- Know the name and function of a fish's most important fins.

## Curriculum Subjects

- Living Things
- Energy & Forces
- Environmental Awareness & Care

## WOW facts!

- A Herring never stops swimming during its lifetime. Every year it swims as far as to the moon and back.
- Flying Fish can leap out of the water, flying up to 30 feet to escape their predator. Their tails can move 50 beats per second to get the speed they need to jump.
- The Sailfish is the fastest fish in the ocean and can travel faster than the quickest submarine!
- A shark's skeleton is not made of bone - it is cartilage, like the bendy bit in your nose!
- Over 99% of an anemone is water!
- Seahorses can swivel each of their eyes independently - so they can look forwards and backwards at the same time!
- Jellyfish don't have a brain!
- Seals can hold their breath for up to 30 minutes and dive to depths of over 230 feet!
- Most fish swim by moving their tail from side to side. Whales and dolphins, which are mammals, swim by moving their tail up and down.
- The Upside-down Catfish found in the Congo swims upside down.

# Classification & Variation

The incredible variety of fish, crustaceans, and invertebrates which SEA LIFE displays at their aquarium will provide a great context to explore the topic of classification. These resources will introduce students to the seven life processes, learning how to identify different species of animals through a classification quiz and the use of keys. There is also scope for students to take part in some imaginative and creative exercises.

## Resources provided

- Student Worksheets 6-9
- Classification Power Point slides

## Before & After activities

### Activity 1: Alive or Not

- Introduce students to the seven life processes using Slides 1-3.
- Students should use the table provided on Student Worksheet 6 to work out whether the things listed are alive or not.

#### Resources:

- Student Worksheet 6
- Slides 1-3

### Activity 2: Guess Who

- Give a copy of Student Worksheet 7 to each student.
- Split the students into pairs.
- Ask each student to pick one of the creatures listed on the Worksheet, but they must not tell their partner what it is.
- Students to take turns in asking their partner "yes or no" questions (e.g. "Does it have a shell?") and discover which creature they have picked by a process of elimination.
- Once students have completed the game, ask them to make a list of any creatures which they think are similar.

#### Resources:

- Student Worksheet 7

### Activity 3: Classification Quiz

- Use Slides 4-17 to complete a classification quiz.
- Students should choose one of the animals shown on slide 6. As a class you will answer a set of questions to discover what sort of an animal it is.
- Click on the answer to each question to progress to the next slide.
- Students may need guidance on some of the questions; others will be obvious from the picture.

#### Resources:

- Slides 4-17

### Activity 4: Name the Animal?

- Display slide 18 to explain how keys are used.
- Students look at the animals shown on Student Worksheet 8.
- By working through the key provided they should find out the name of each animal and note it in the box underneath its picture.

#### Resources:

- Slide 18
- Student Worksheet 8

### Activity 5: Count the Species

- Students look at the image on Student Worksheet 9, and note down how many different types of animals they can see.

#### Resources:

- Student Worksheet 9

### Activity 6: Imagine the Animal Which...

- Ask students to read the description of the animal on Student Worksheet 9.
- They could draw a picture of how they think that animal could look.
- After five minutes show them the picture of the animal on slide 19.

#### Resources:

- Slide 19
- Student Worksheet 9

## During your visit

- Ask students to make a list of three creatures they have seen from the following groups: Crustaceans, Fish, and invertebrates. They could draw a picture of one of the animals and label the key features of that group in class.
- Draw a picture of two animals within one group and point out the features that are the same and those that are different.

## Learning Objectives

- ~ Know the life processes which are common to all animals.
- ~ Understand that animals can be identified and assigned to groups.
- ~ Know how to make and use keys.

## Curriculum Subjects

- ~ Living Things
- ~ Energy & Forces
- ~ Environmental Awareness & Care

## WOW facts!

- ~ The Horseshoe Crab is more closely related to spiders than crabs!
- ~ Unlike other bird species, penguins have solid bones and can't fly!
- ~ Turtles are ancient reptiles - they've been around for 200 million years and can live to be 100 years old!
- ~ There are 35 different seal species worldwide. The rarest is the Mediterranean Monk Seal with fewer than 500 individuals remaining.
- ~ The Giant Pacific Octopus species is protected due to their declining numbers.
- ~ Most species of sharks are considered to be threatened or endangered.
- ~ There are over 31,500 species of fish, more than any other class of vertebrates.
- ~ The crocodile family is believed to be over 200 million years old.

# Food Chains

The sea provides an exciting context to help students understand the important topic of food chains. These materials help students to understand the vital importance of the sun in helping micro-organisms to grow, and the part which these micro-organisms play in the ocean's food chains. Students will also learn about the differences between producers and consumers, predators and prey, before examining food chains and food webs as a way of talking about these relationships. Examination of the tide pool during a visit to SEA LIFE Aquarium will provide a tangible example of the balance of a food chain within a habitat.

## Resources provided

- Student Worksheets 10-12
- Food chains Power Point slides

## Before & After activities

### Activity 1: Connecting the Food Chain

- Using slides 1-3 remind students of the core life processes.
- Introduce students to the concept of food chains using slides 4-13.
- Cut out the color coded cards on Student Worksheet 10.
- Give one card to each member of the class.
- Tell students that their card is part of a food chain and that they have to find the other members of their food chain. All members of their food chain will have cards the same color.
- Once they have found the other members of their chain, students should arrange themselves in the correct order. This can be determined from looking at what their card consumes and what consumes it.
- Some chains will be longer than others.
- Show the complete chains using slides 14-18.

#### Resources:

- Student Worksheet 10
- Slides 1-18

### Activity 2: Your Food Chain

- Using slide 19, explain that humans are at the top of the food chain.
- Ask students to look at the three meals on Student Worksheet 11 and work out the food chains for the elements specified.
- Students could also think of their own meals to construct a food chain.

#### Resources:

- Slide 19
- Student Worksheet 11

### Activity 3: What's in the Web?

- Using slides 20-21, explain that most animals will have more than one predator and more than one prey.
- Explain that this can be shown using food webs.

- Ask students to read the information on Student Worksheet 12 and complete the food web to show how the animals inter-relate.

- Display the completed web on slide

#### 22. Resources:

- Student Worksheet 12
- Slides 20-22

### Activity 4: Acting out the Food Chain

- Split students into small groups and ask them to choose one of the food chains they have studied during the lesson.
- Each student could act out one of the animals in the food chain.
- Ask them to perform their food chain for the rest of the class and ask the rest of the class to guess which animals are being acted out.

#### Resources:

- None required

### Activity 5: Taking Care of the Food Chain

- Display slides 23-24 which contain information on some of the environmental issues which are threatening the ocean's wildlife and how this affects food chains.
- Ask students to write a letter to their state representative explaining the dangerous effects which pollution can cause and asking them to help reduce human impact.

#### Resources:

- Slides 23-24

## During your visit

- Ask students to make a note of the stages in a tide pool food chain. They can ask the assistant to help them.
- Ask students to look for the following during their visit: a herbivore (or primary consumer); a small carnivore (a secondary consumer or predator); a large carnivore (a tertiary consumer or top predator).

## Learning Objectives

- ~ Know that every animal needs food for growth and activity.
- ~ Understand the difference between predators and prey.
- ~ Know that some animals can be both predators and prey.
- ~ Know that micro-organisms are important in food chains.
- ~ Know that nearly all food chains start with a green plant.
- ~ Know that many animals living in one habitat will often rely on each other for food.

## Curriculum Subjects

- ~ Living Things
- ~ Energy & Forces
- ~ Environmental Awareness & Care

## WOW facts!

- ~ The Blue Whale, which is the largest animal on Earth, survives by eating some of the smallest creatures on Earth, plankton.
- ~ A Tiger Shark will eat almost anything. This can often include human garbage; they have been known to eat pieces of tire and even license plates!
- ~ More humans are likely to die from an encounter with a toaster than with a shark. Yet 100 million sharks are killed by people every year!
- ~ Phytoplankton is responsible for half of all the energy which is converted from the Sun's light into nutrition.
- ~ Jellyfish are a threat to other marine wildlife. They can consume large quantities of plankton as well as the eggs and larvae of important fish species.

# Adaptation

There are a huge variety of different environments and extreme conditions in the underwater world, and animals must adapt to them in order to survive. These activities will help your students to understand that the way in which all living things have evolved reflects their lifestyle, enabling them to catch prey or to inhabit what can sometimes be a hostile environment. They will also examine the ways in which the rapid changes to the oceans, caused by man, are creating problems for animals which live in these habitats.

## Resources provided

- Student Worksheets 13-16
- Adaptation Power Point slides

## Before & After activities

### Activity 1: Where do I live?

- Use slides 1-2 to explain the concept of habitats to students
- Students to examine the pictures of six animals and habitats on Student Worksheet 13.
- They should link each animal to its environment and say why they think it is suited to that environment.

#### Resources:

- Slides 1-2
- Student Worksheet 13

### Activity 2: The Humboldt Penguin

- Using the slides, explain that some animals have adapted to suit their environments in very different ways.
- Tell your students to examine the image of a Humboldt penguin on Student Worksheet 14.
- They should look at the descriptions of its specializations underneath, and put the corresponding letter for each specialization in the box next to the appropriate label on the diagram.

#### Resources:

- Slides 3-6
- Student Worksheet 14

### Activity 3: A Day in the Life of

- Students pick one of the three animals listed on Student Worksheet 15.
- Ask them to write a short story about a day in that animal's life, including information on how that animal makes use of its adaptations.

#### Resources:

- Student Worksheet 15

### Activity 4: Brand New Adaptation

- Ask students to draw a picture of a brand new creature which has adaptations to help it survive in a hostile environment.
- Students label their drawing and write a short paragraph to explain how the adaptations are used.

#### Resources:

- None required

### Activity 5: Protecting the Sharks

- Display slides 7-9 to introduce students to the topic of conservation.
- Students to read the information on the shark's adaptation, and the threats which they are under from humans on Student Worksheet 16.
- Conduct a class discussion about what could be done to protect sharks.
- Students can create a poster to persuade people to help protect sharks and their environment.

#### Resources:

- Slides 7-9
- Student Worksheet 16

## During your visit

- Ask your students to draw one of the creatures which they see during their visit to SEA LIFE. They should highlight features which have been specially adapted and write a note to explain why they think that the animal has adapted in that way.
- Ask students to find one of the following creatures, and note down how that animal finds food to survive and how it protects itself from predators. Ask students to compare and contrast with notes taken on the other creatures.
  - Cownose Ray • Seahorse • Clown fish
  - Eel • Lion fish • Shark

## Learning Objectives

- ~ Know that animals and plants are suited to their environment.
- ~ Understand that certain animals have adapted in very specific ways in order to live in extreme environments.

## Curriculum Subjects

- ~ Living Things
- ~ Energy & Forces
- ~ Environmental Awareness & Care

## WOW facts!

- ~ If a sea star loses an arm to escape a predator, it just grows another one!
- ~ Sharks have been around longer than dinosaurs, over 350 million years!
- ~ Otters keep warm in water as their fur is so thick their skin never gets wet!
- ~ Clown fish live among venomous anemones, but avoid being harmed by allowing the tentacles to graze their body until they build immunity to the venom
- ~ The clown fish can change from female to male, once the male in its colony dies.
- ~ An octopus has blue blood, three hearts, and can alter the complexion of its skin in the blink of an eye!
- ~ A seal can have a layer of blubber up to two inches thick to help protect them from the cold conditions which they live in.