Lesson 14

love every drop anglianwater

Investigating the Rutland Sea Dragon

Before you start this session...

Print session sheets if you need them.

Make sure you have access to the internet so that you can watch video clips on YouTube.

Items you will need...

For activity 14.1

- Print out sheets
- Shoe box (or similar)
- Card and paper
- Plasticine and craft materials

For activity 14.2

- Print out sheet
- Ingredients (see worksheet)

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anglianwater.co.uk/community/schools/

Lesson 14
Information sheet

You can use our Rutland Sea Dragon assembly and teacher notes to find out about the Sea Dragon in STEM lesson 13. This can be used to follow up and discover more about the Rutland Sea Dragon and other Ichthyosaurs.

The Rutland Sea Dragon was discovered in Rutland Water reservoir in January 2021 and was excavated by a team of expert palaeontologists in summer 2021.

The Rutland Sea Dragon was excavated by a team of expert palaeontologists in summer 2021. The fossil of the Rutland Sea Dragon has been excavated and is being studied and conserved so it can be returned to Rutland in the future.

The discovery of the Rutland Sea Dragon is helping to build up greater understanding of Ichthyosaurs and the time they were alive. As no one saw these creatures when they were living, everything we know about them – the rocks, soils and fossils – has been learnt by palaeontologists and Earth Scientists. Understanding the planet now helps them understand what the Earth was like 180 million years ago when the Rutland Sea Dragon swam in the ocean.

Finding out about long extinct animals has been a fascination for many people and we are still learning more about them. Can you discover more about the amazing world we live in and the similarities we share with the world of the Ichthyosaurs?

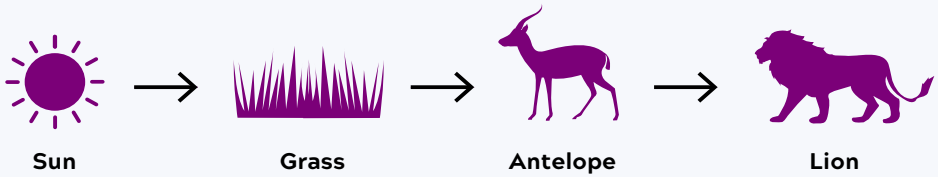
This session will help you discover what Ichthyosaurs ate, their habitats, how we know about this and the importance of Mary Anning to the Rutland Sea Dragon.

Activity 14.1

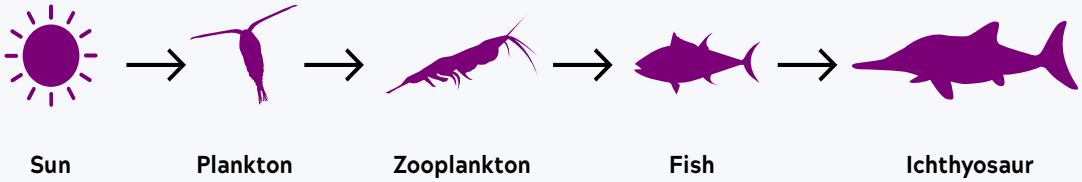
Food web

All animals and plants get their energy from other plants and animals or the sun. Food webs work in the same way now as they did when the Rutland Sea Dragon was swimming around. Food chains show the path of energy through a group of plants and into animals that eat each other.

This is an example of a food chain



This is an example of an ocean food chain



Food chains in the ocean start with plankton. Tiny animals that feed on the energy from the sun, like plants on the land.

Did you know

The first stage of the food chain is always the sun so it is not usually written in food chains.

The **bottom** of the food chain is called the **Producer**. The producers are the ones that consume the suns energy which is transferred to the other animals in the food chain.

The animals that feed on the producers are know as **Consumers**.

Activity 14.1

Food web

Activity

From the two food chains on the previous page fill out these boxes to show if they are producers or consumers.

Producer

Consumer

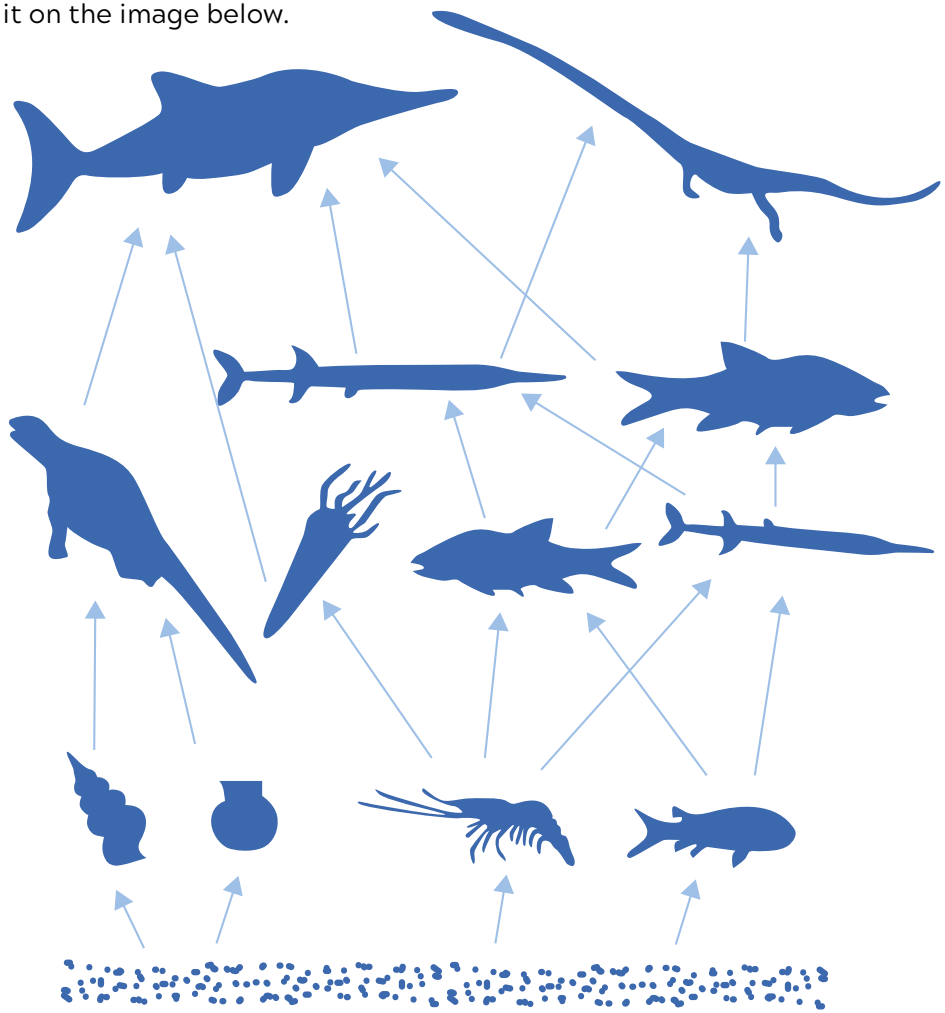
Activity

Food webs show the range of plants and animals that feed off each other. Animals may feed from many different sources – animals or plants or both. You may be familiar with the names given to these groups. Can you draw a line to match them?

Herbivore	**Eats other animals**
Omnivore	**Eats only plants**
Carnivore	**Eats animals or plants**

Activity

Food webs show the complex path of energy transferring through many plants and animals all with the source of energy originating from the sun. Have a look at this food web, can you find the Ichthyosaur? Circle it on the image below.



Ichthyosaurs are the top predator or apex predator. Apex predators are the top of the food chain, there is nothing that will hunt and eat them.

Activity 14.1

Food web

What eats what? Diorama challenge

Activity

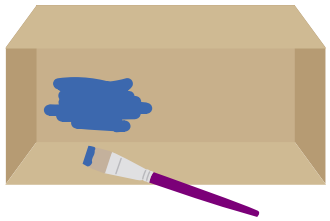
A diorama is a great way to show a scene in 3D, they are models to show how things looked. You can make a simple diorama with a shoe box.

1. Plan your diorama and do some research, what can you include? What animals and plants lived in the ocean? What was it like at the time of the Rutland Sea Dragon? Can you look at the food web and show the animals who fed from each other?

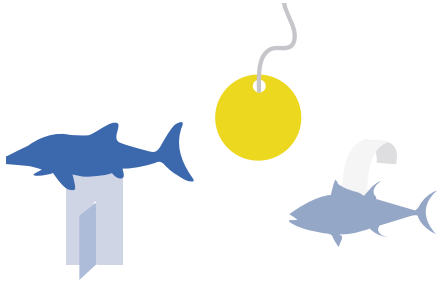
2. Cut a window in the lid of your shoe box.

Top tip: You can use fishing wire or cut acetate (clear plastic film) into strips to make your creatures for your diorama. Better still why not recycle and use clear plastic packaging to help make your creatures appear as though they are swimming.

3. Paint the inside of your shoe box.



4. Make some items to put in your shoe box to show the Ichthyosaurs world. Use plasticine to build animals to add to your scene or draw on card and cut them out. Perhaps you can make some of the creatures from plasticine or salt dough (see STEM session 13 for instructions.)



Activity 14.1

Food web

What eats what? Diorama challenge

Duria Antiquior A more Ancient Dorset by Henry De La Beche 1830.
Reproduced by permission of the Geological Society of London.

Maybe this painting, created at the same time as Mary Anning was discovering the fossils, could be inspiration. Henry De La Beche created this picture to help imagine what the oceans may have looked like in the time of the Ichthyosaur.

Did you know

The power of poo

Coprolite, fossilised dinosaur poo, has been key to finding out about the food chains in extinct prehistoric animals. Studying fossilised poo can indicate the size of the animal but also what they ate. The contents of the poo can include fish scales and bones for example.

Find out more by clicking the YouTube links below...

Lyme Regis Museum Investigates – The Case of the Fossilised Poo

What did Mary Anning discover in fossilised poo? Natural History Museum

Lyme Regis Museum Investigates – The Case of the Ichthyosaurs Dinner (subtitled version)

Activity 14.2

Mary Anning

Mary Anning was a famous fossil hunter who was born in 1799. She is famous for finding some amazing fossils and discovering several species including the very first Ichthyosaur when she was 12 years old. Mary began looking for fossils like ammonites and belemnite as a child to sell to make money for her family. As she grew up she made lots of discoveries, recorded her finds and carried out lots of research throughout her life.

Image reproduced by permission of the Geological Society of London.

Activity

Can you find out about Mary Anning?

Carry out some research. Can you creatively display your research, **create a poster**, **a comic strip**, **write a story**, **a song or even a play**? Or you could draw your own pictures in the Mary Anning picture strip on the next page.

Here are some places you could start your research

Mary Anning: the unsung hero of fossil discovery Natural History Museum (nhm.ac.uk)

Mary Anning - Fossil hunter - BBC Bitesize

Mary Anning's Story youtu.be/5YBiYQXtdM8

Did you know

Small fossils found around the Rutland Sea Dragon are very important. When the Rutland Sea Dragon died, layers of sediment and rock formed over the skeleton. Other animals died at the same time and were trapped and were also fossilised.

Some species have been greatly researched so a lot more is known about them, palaeontologists call these **index fossils**. The index fossils like ammonites and belemnites found around the Rutland Sea Dragon have been used to understand the age prior to more in depth laboratory tests. This even includes ‘micro-fossils’ found in the surrounding sediment.

Activity 14.2

Mary Anning

Activity Draw a picture which reflects each of the facts below.

Mary Anning was born in 1799, in the town of Lyme Regis, South West England.	Mary was born to a poor family and was one of ten children. From the age of six she helped her father look for shells and bones at the beach.	Mary would clean the shells and 'curiosities' to sell to tourists visiting the seaside.	At Sunday school Mary learnt to read and write. She learnt from reading that the 'curiosities' she found at the beach were fossils of ancient animals.	Mary and her brother Joseph spotted the skull of a very large animal. After months of digging she found the first Ichthyosaur at just 12 years old.

Mary sold the skeleton to a collector and it ended up being displayed in the British Museum.	While collecting fossils, cleaning, drawing and recording her finds, Mary became an expert and many people sought her wisdom.	Mary and her dog Tray also discovered the first Plesiosaurus in 1823.	Mary discovers the first Pterodactyl and the secrets of coprolite, fossilised dinosaur poo.	In her lifetime she was not formally recognised for her work. Now she is celebrated as the Mother of Palaeontology.

Activity 14.3

Oreo Ammonite Cheesecake

Activity

Bake a cheesecake to show what the layers of the earth look where fossils were formed. Of course, in the tastiest way possible, with Oreos as our ammonites!

You will need:

- Loose sided cake tin
- Mixing bowl
- Rolling pin
- Sandwich bag
- Pan or microwaveable bowl
- Spoon
- Grater

Ingredients:

- 250g Biscuits (whatever you like but digestives, Biscoff biscuits or more Oreos would all work well)
- 12 Oreos
- 100g Butter
- 500g Cream cheese
- 100g Icing sugar
- 1 Teaspoon Vanilla extract
- 300ml Double cream
- Optional: chocolate chips or chocolate (grated)

Instructions

1. Crush the biscuits into crumbs. Put them in a food processor or put them in a large sandwich bag and gently crush with a rolling pin.
2. Melt the butter in a microwave at low temperature or on a hob with the help of a grown up.
3. Mix the butter and biscuits together and put into a loose bottomed cake tin and press down, the back of a spoon will help. Put it in the fridge to chill.
4. In a large mixing bowl put the cream cheese, vanilla extract and icing sugar. Whisk at a slow speed.
5. Place eight of your Oreos on the biscuit base then pour the cream cheese mixture over them. Smooth down and put back in the fridge.
6. Whip double cream to soft peaks and pour over the cream cheese mix. Optional extra: create another layer putting some chocolate chips down before adding the cream.
7. Grate some chocolate over the top and decorate with any remaining Oreos.
8. Refrigerate for at least two hours, overnight is best.
9. Remove your cheesecake from the tin and serve. When you slice through your cheesecake see if you can find the Oreo ammonite in the layers.