Name: …….. Class: ……

Year 8 Unit 2:

Should we protect our oceans?

Professionalism. Inclusion. Pedagogy. Curriculum.

Be professional. Be inclusive. Be a learner. Be knowledgeable.

Unit Overview: Our Oceans
ENQUIRY: Should we protect our oceans?

Unit intention:		
Success criteria	✓	X
• I can explain why the ocean is important • I can explain why people live near the oceans • I can explain the problems caused by overfishing • I can assess the impacts of climate change on the ocean • I can draw a timeline showing how long plastic lasts • I can explain how we can reduce our plastic use		

Unit summative and formative assessment details:

Several EQs
End of unit assessment

Home Learning (What and how often):

Variety of consolidation sheets

Topic Sequence

- Where are the Oceans?
- Characteristics of the Oceans
- Human uses of the Oceans
- Problems impacting the Oceans
- Possible protections for the Oceans
- Assess strategies

Recommended reading/ watching

Turning the tide on plastic – Lucy Seigle (9n study centre)

There is no Planet B – Mike Berners-Lee

A Plastic Ocean - Netflix

Blue Planet 1 and 2 – BBC iPlayer

Places to visit:
London Aquarium

End of unit evaluation

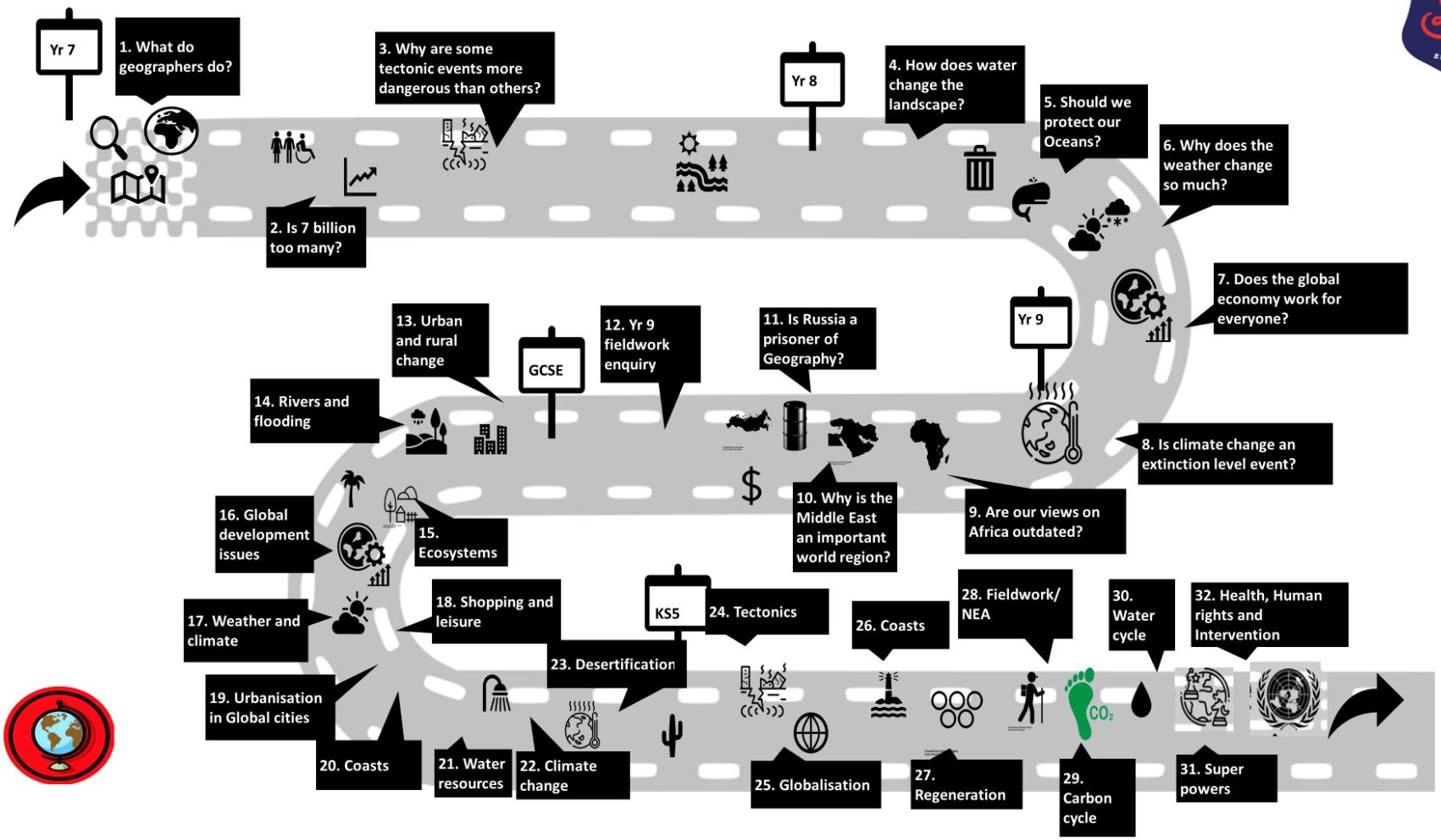
Success criteria – Have you met them? Show your evidence in preparation for your assessment.
1.
2.
3.
4.
5.
6.
How will you improve your work?

Year 8 (Term 2)					
Learning goal	**Extending**	**Mastering**	**Learning**	**How assessed**	**HW** **Check**
To understand what the world's oceans are like	To explain why the ocean is so important	I can explain the structure of the Oceans	I can name and locate the worlds' oceans.	End of unit exam 2 x EQ	We can't live without the oceans poster
To understand why people live near the oceans	I can explain the distribution of major world cities	I can describe the distribution of major world cities	I can name 10 Island countries	2 x EQ	Anagrams sheet
To be able to describe how humans are threatening the ocean biome and to explain how those threats affect us.	I can assess the impact of climate change on the oceans	I can rank order the threats to the oceans	I can identify the threats to the oceans	Climate Change EQ	Overfishing solutions
To be able to explain the global impact of plastic pollution	I can explain how ocean garbage patches are formed	I can explain how whales are affected by plastic pollution	I can draw a timeline showing how long plastic lasts	End of unit test	Rubber ducks
To understand how people are trying to protect our oceans	I can explain how we can reduce our plastic use	I can explain what beach clean ups are	I can describe what sustainable fishing is	End of unit test	Plastic footprint

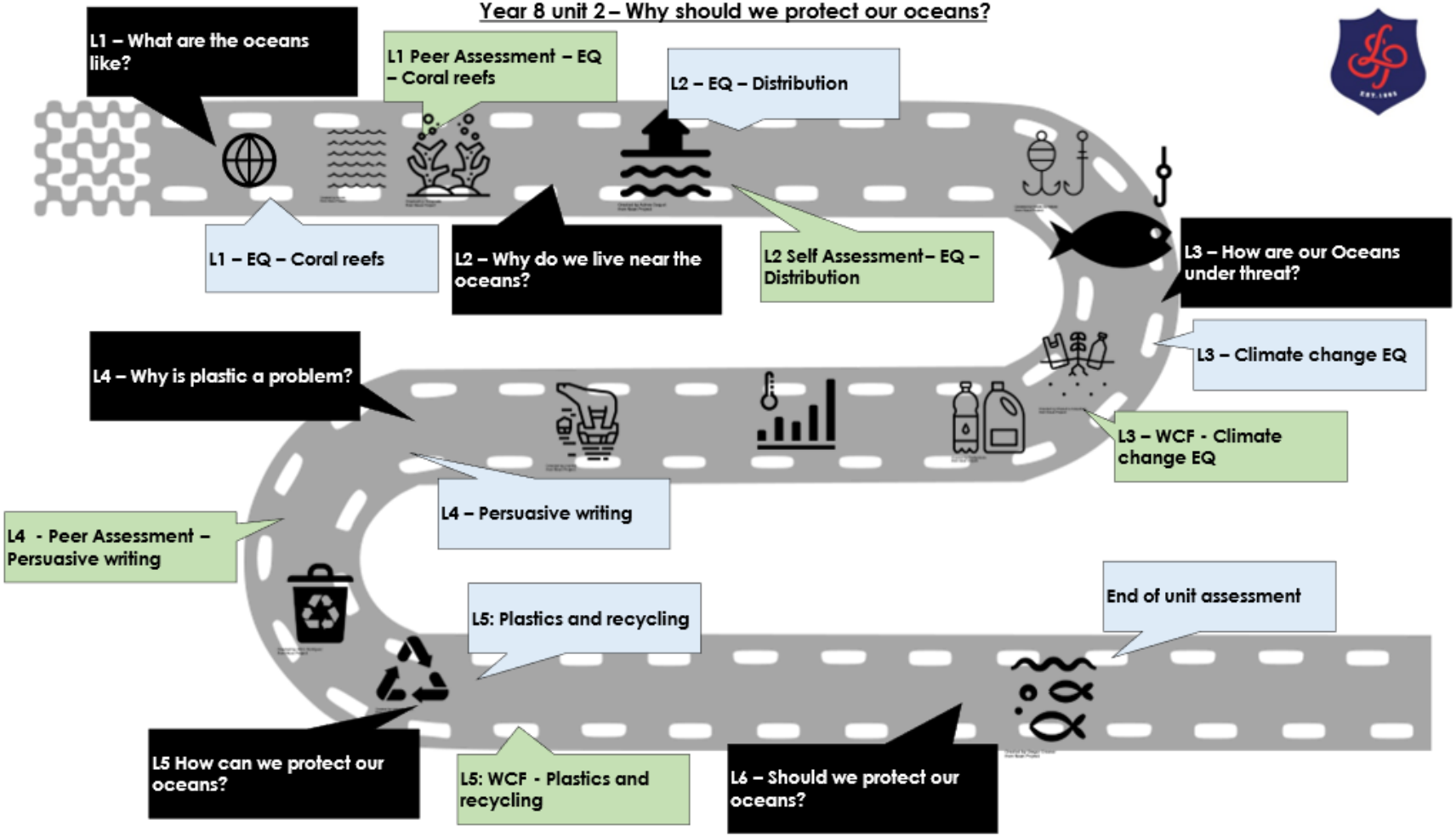
Glossary

Key word	Definition
Marine	
Ocean	
Photosynthesis	
Phytoplankton	
Global conveyor	
Coral Reef	
Overfishing	
Nurdles	
Biodegradable	
Photodegradable	
Gyre	
Zooplankton	
Phytoplankton	
Food chain	
Overfishing	
Sustainability	
Food security	
Climate Change	
Acidification	
Ecosystem	
Biodiversity	

Geography at Langdon Park School – From 2022



Year 8 unit 2 – Why should we protect our oceans?



Big Picture

Lesson 1: What are the oceans like?

L/M/E		I think I can …	My teacher thinks I can …
Learning	I can name and locate the worlds' oceans.		
Mastering	I can explain the structure of the Oceans		
Extending	To explain why the ocean is so important		

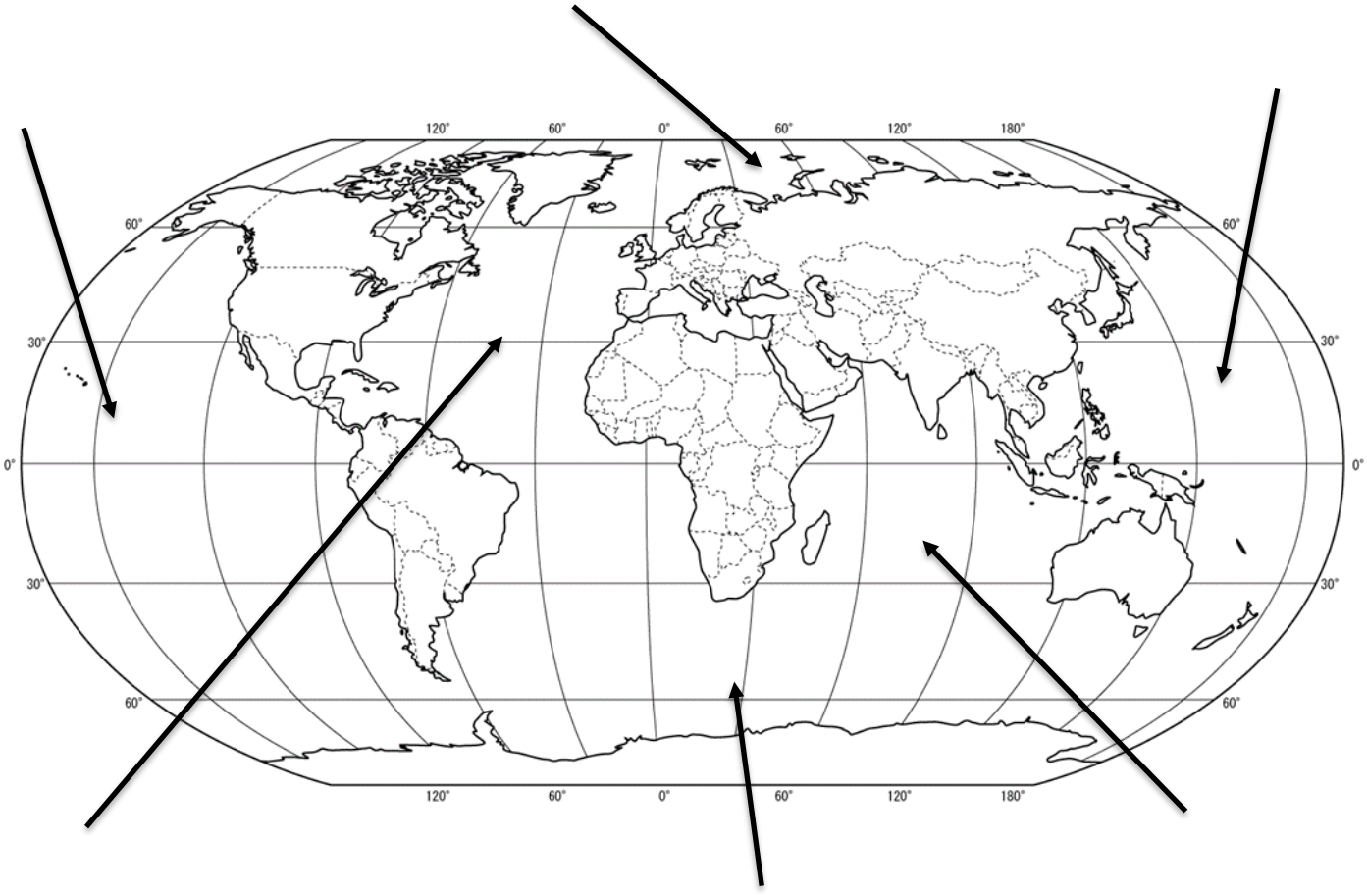
Do now: Complete the quiz

Statement number	**True or False?**	**Shock factor: 1 – 10 and why?**
1.Our oceans cover 70% of the Earth's surface		
1. The majority of all life on Earth is aquatic		
2. Oceans have the fewest number of endangered species on Earth		
3. Less than 5% of the planet's oceans have been explored		
4. We know around 75% of all marine species in our oceans		
5. Over 70% of our planet's oxygen is produced by the ocean.		
6. The Atlantic is the largest ocean on Earth		
7. It is possible to find rivers and lakes beneath the ocean		
8. Around 10% of the USA lies beneath the ocean		
9. The ocean regulates the global temperate of the land		

Starter: Key words

Biome	A huge body of saltwater that covers around 71% of the Earth's surface.
Ocean	Activities done for enjoyment.
Transportation	Areas of our planet with similar climates, landscapes, animals and plants.
Recreation	The means of moving products and people around Earth.

Label the Oceans



Name the Ocean that connects:

The UK and West Africa ……..

Kenya and India ……

Japan and the USA ……..

South Africa and Antarctica ……

The Ocean floor:

Work out the anagrams to finish the paragraph

The ocean floor has (staminnou) …… And deep (chertnes) ……..

They result from (latep) …… movements. So, you can expect (quathseekar) …….. too. These can cause giant waves called (imutsna) ……..

That travel across the ocean.

The origins of the oceans

Video questions

How much of the earth is covered in water? ……

How long have the oceans been here?.....

Which gas first came from the ground?.....

Where did the rest of the water come from? ……

Where do you think the water came from?.....

Put the statements in order

As the earth cools the gasses turn to clouds and it rains for thousands of yrs.	
4.5 billion yrs ago, the earth erupts lava, ash and gasses.	
The water makes its way to the low-lying areas and collects to form the oceans.	
4.2 billion yrs ago, the earth starts to cool.	
Meanwhile comets carrying water in the form of ice crash into the earth and deliver more of our water.	

Your connection with the ocean stretches back billions of years. Explain why

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The ocean absorbs CO_2, which is then used by phytoplankton.

What are phytoplankton?

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What do they use the CO_2 for?

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Phytoplankton can't grow in the deep ocean. Why not?

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In one way, phytoplankton are the most important species in the ocean. Why?

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Some of the CO_2 in the ocean gets locked up in fossil fuels. Will this be forever? Explain

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Explain what the global conveyor is, in your own words

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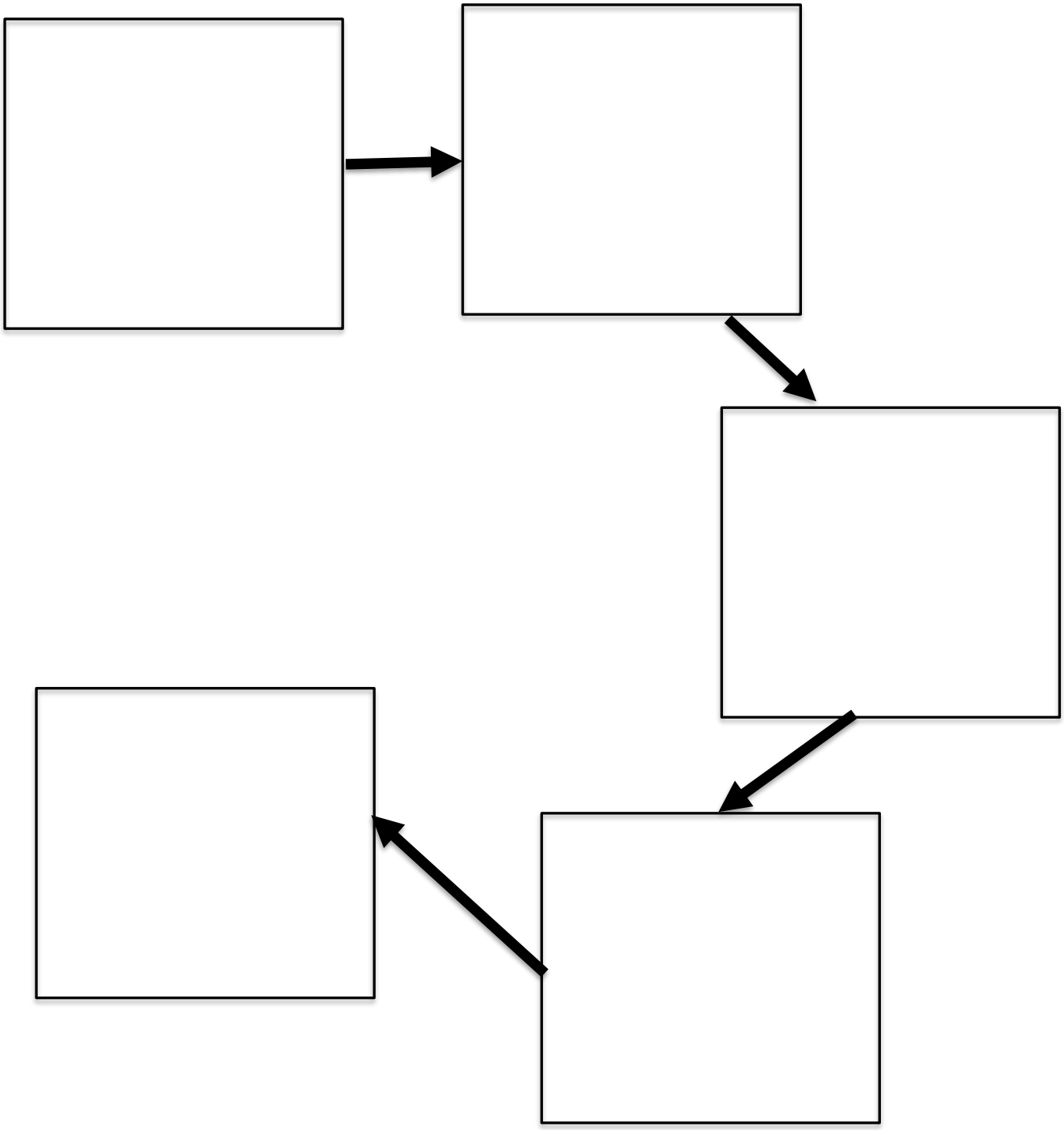

Use the statements, put them in order and draw a picture to illustrate

- Photosynthesis produces oxygen, which goes into the atmosphere
- Tiny plant called phytoplankton use the CO_2 and water to make glucose
- CO_2 is absorbed by the ocean
- Phytoplankton use glucose and nutrients from the water to help them grow
- The glucose is made through photosynthesis, which needs sunlight to happen

Video

1. How many ducks went around the world from the ship?	2. What have scientists used the ducks' paths to study?
3. What percentage of currents are surface currents?	4. On the open ocean, what is the major force controlling the surface currents?
5. Loops of water in the oceans are known as what?	6. What is the effect called that impacts on the movement of the ocean currents?
7. What do the deep ocean currents do?	8. How quickly does the global conveyor belt move?
9. How long would it take a water drop to move around the Earth on the global conveyor belt?	10. What is the main reason the global conveyor is slowing down?

Read the information and complete the questions.

One way that the world's ocean affects weather and climate is by playing an important role in keeping our planet warm. The majority of radiation from the sun is absorbed by the ocean, particularly in tropical waters around the equator, where the ocean acts like a massive, heat-retaining solar panel. Land areas also absorb some sunlight, and the atmosphere helps to retain heat that would otherwise quickly radiate into space after sunset.

The ocean doesn't just store solar radiation; it also helps to distribute heat around the globe. When water molecules are heated, they exchange freely with the air in a process called evaporation. Ocean water is constantly evaporating, increasing the temperature and humidity of the surrounding air to form rain and storms that are then carried by trade

winds. In fact, almost all rain that falls on land starts off in the ocean. The tropics are particularly rainy because heat absorption, and thus ocean evaporation, is highest in this area.

Outside of Earth's equatorial areas, weather patterns are driven largely by ocean currents. Currents are movements of ocean water in a continuous flow, created largely by surface winds but also partly by temperature and salinity gradients, Earth's rotation, and tides. Major current systems typically flow clockwise in the northern hemisphere and anti-clockwise in the southern hemisphere, in circular patterns that often trace the coastlines.

Ocean currents act much like a conveyor belt, transporting warm water and precipitation from the equator toward the poles and cold water from the poles back to the tropics. Thus, ocean currents regulate global climate, helping to counteract the uneven distribution of solar radiation reaching Earth's surface. Without currents in the ocean, regional temperatures would be more extreme—super hot at the equator and frigid toward the poles—and much less of Earth's land would be habitable.

Where is the majority of solar radiation absorbed?	
What else does the ocean do with solar radiation?	
Why are the tropics particularly rainy?	
What is a current?	
Which direction do currents flow?	
How do currents regulate the climate?	

What are the different areas of the ocean?

Ecosystem Name	Description	Where is it found?	Why is it important?
Coral Reefs and Sea Grasses			
Mangrove Forests			
Polar Ocean			
Sunlit Zone			
Deep Sea			

“The deep ocean is as challenging to explore as space”
“We know more about the surface of Mars than we do about the deepest parts of our seas”

Do you agree or disagree?

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Why do you agree or disagree?

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How can this be possible?

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Why is it so difficult to get to the bottom of the ocean?

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Literacy challenge

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Animals

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‘Describe the location of the Mariana Trench’

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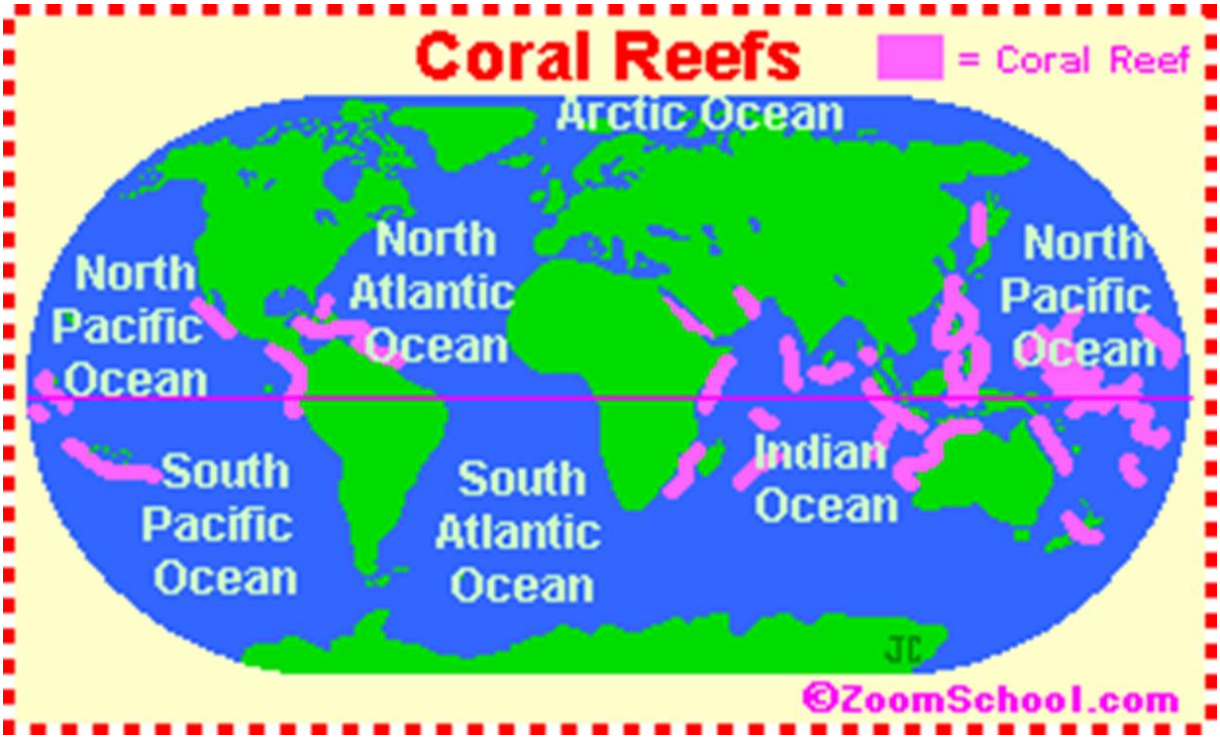

'Describe the distribution of coral reefs' (4 marks)

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Time to reflect:

1……

2……

3……

4……

5……

Lesson 2: Why do we live near the oceans?

Big Picture

L/M/E		I think I can …	My teacher thinks I can …
Learning	I can name 10 Island countries		
Mastering	I can describe global population distribution		
Extending	I can explain why global population density is uneven		

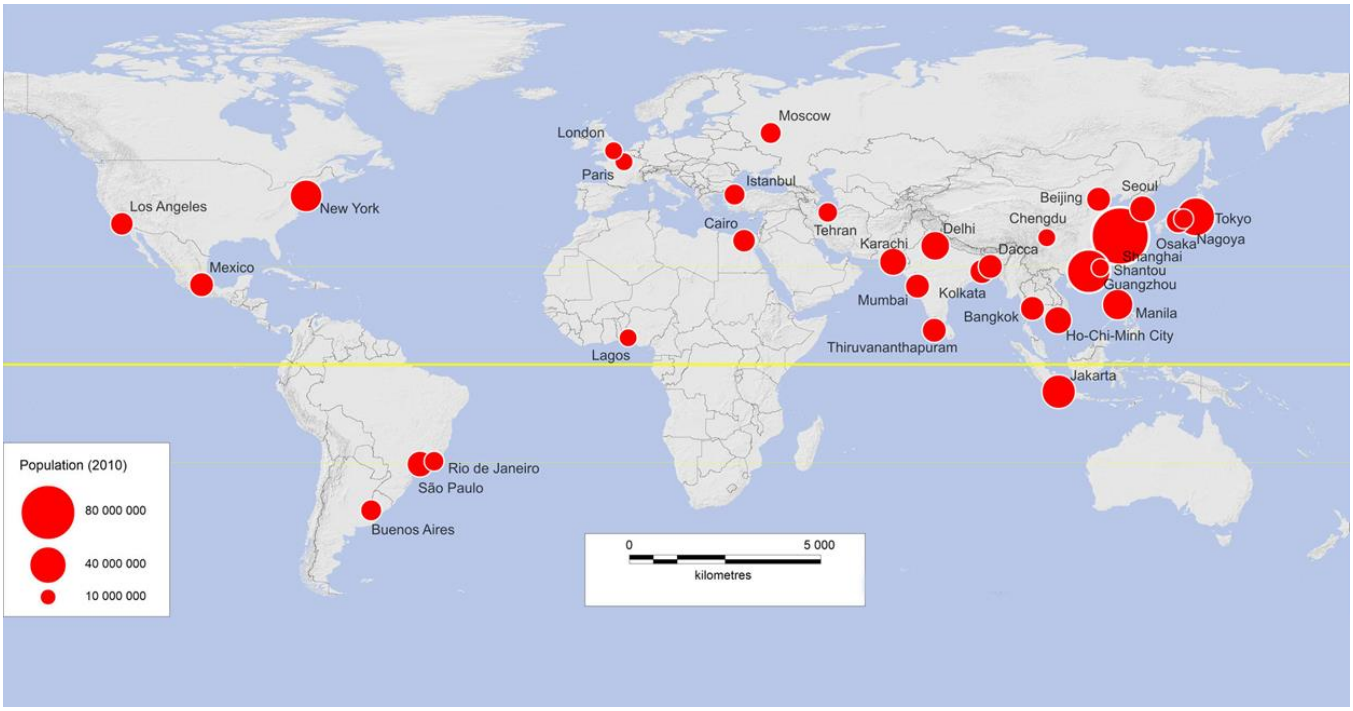
Do now: True or false

Our oceans cover 70% of the Earth's surface	**The majority of all life on Earth is aquatic**	**Oceans have the fewest number of endangered species on Earth**
Less than 5% of the planet's oceans have been explored	**We know around 75% of all marine species in our oceans**	**Over 70% of our planet's oxygen is produced by the ocean.**
It is possible to find rivers and lakes beneath the ocean	**The Atlantic is the largest ocean on Earth**	**The ocean regulates the global temperate of the land**

Starter:

Name 10 countries that are Islands

Why do we live so close to the ocean?



'DESCRIBE the distribution of our major world cities' (4 marks)

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Reflect and review

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Trade:

What is this map showing?

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Why does this affect where our cities are?

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Fishing:

What is this map showing?

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Why does this affect where our cities are?

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'EXPLAIN the distribution of our major world cities' (4 marks)

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Photo	Things we use the Ocean for	Notes about these uses
A		
B		
C		
D		
E		
F		
G		
H		

Time to reflect:

1……

2……..

3……..

4……

5……

6……

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8……..

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10……

Big Picture

Lesson 3: How are our oceans under threat?

L/M/E		I think I can …	My teacher thinks I can …
Learning	I can identify the threats to the oceans		
Mastering	I can rank order the threats to the oceans		
Extending	I can assess the impact of climate change on the oceans		

Do now: Threats to the Ocean

What does each image show?

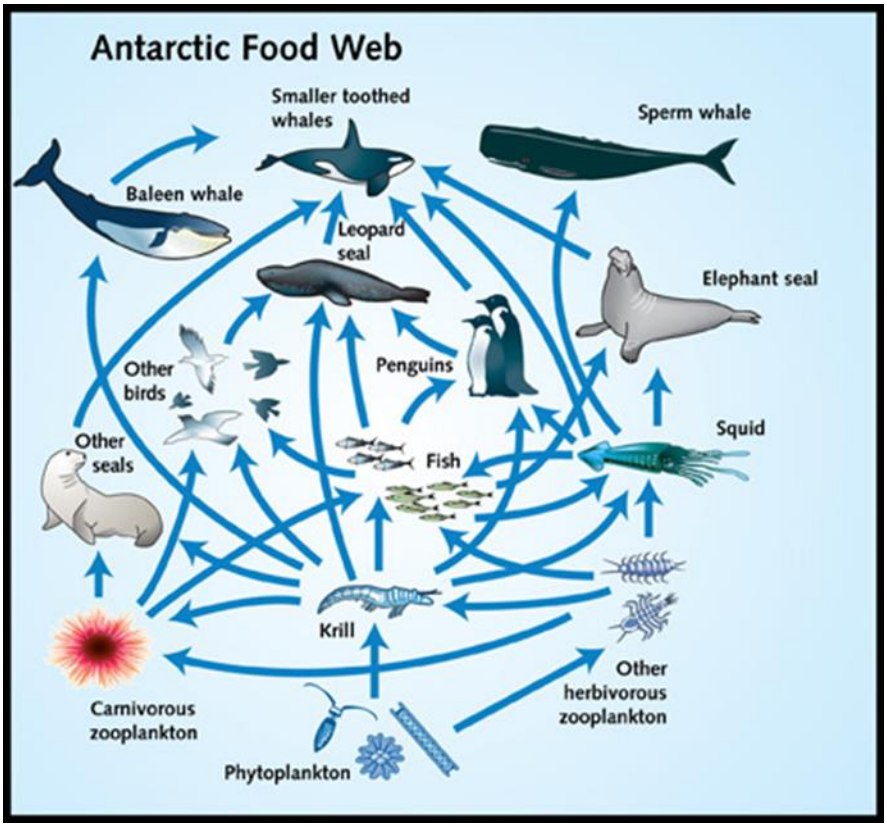
How it might be linked to the oceans

Discuss why it relates to the threat of the oceans.

Starter: True or false

Over 100 million marine animals are killed each year due to plastic debris in the ocean.	
50 percent of the plastic we use, we use just once and throw away.	
Enough plastic is thrown away each year to circle the earth eight times.	
It takes 500-1,000 years for plastic to degrade or breakdown.	
Virtually every piece of plastic that was ever made still exists in some shape or form (with the exception of the small amount that has been incinerated).	
Plastic chemicals can be absorbed by the body—50 percent of Americans age six or older test positive for BPA (a plastic chemical).	
Some of these compounds found in plastic have been found to alter hormones or have other potential human health effects.	

Threat	A summary of the threat
Coastal Development	
Pollution	
Fishing	
Climate Change	
Oil spills	



Which animals are producers?

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Which animals are consumers?

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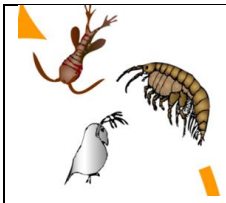
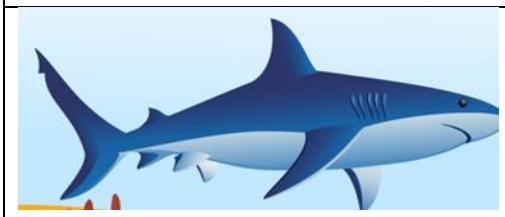
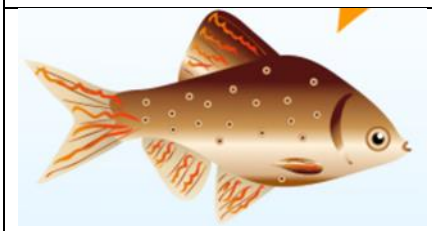
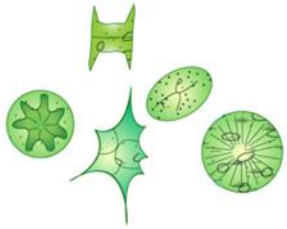
	Zooplankton	
	Shark	
	Small fish	
	Phytoplankton	
	Fish larvae	

Climate change (or global warming), is the process of our planet _____ __. The Earth has _____ by an average of 1°C in the last century, and although that might not sound like much, it means big things for people and wildlife around the globe.

Unfortunately, rising _____ don't just mean that we'll get nicer _____ – if only! The changing climate will actually make our weather more _____ and _____.

unpredictable | extreme | temperatures | warmed | weather | heating up

	Threat Justify the position
1	
2	
3	
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Assess the impact of climate change on the world's oceans' (8 marks)

You need to rank the four threats of climate change from MOST to LEAST important

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You MUST be able to EXPLAIN your ranking by saying WHY they are more/less important

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Stretch: Could any of these threats have positive impacts?

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Now write your answer

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Time to reflect:

3. The three most important parts of the lesson were:	2. The two parts of the lesson I most enjoyed were:	1. The one question I would like to ask is:

Lesson 4: How have people affected the oceans – plastic pollution

Big Picture

L/M/E		I think I can …	My teacher thinks I can …
Learning	I can draw a timeline showing how long plastic lasts		
Mastering	I can explain how whales are affected by plastic pollution		
Extending	I can explain how ocean garbage patches are formed		

Do now:

What's the best thing about plastic?

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Starter: Why is plastic useful?

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Marine Pollution	Able to be maintained at a certain rate.
Biodegradable	The contamination of the sea by substances that are harmful to living organisms as a result of human activity.
Sustainable	Plastics which are 5mm in size or smaller. They can be from materials which are biodegradable.
Microplastic	A process that enables a substance to break down into natural materials in the environment without causing harm.

Video notes:

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Breakdown	Item	Estimated years	Actual years
First (quickest)			
Second			
Third			
Fourth			
Fifth			
Sixth			

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Complete the timeline:

Timeline showing ……

Circle or highlight the items on your timeline made of plastic.

Which tends to break down first, items made of plastic or those made of natural materials? ……

Why could this be a problem if plastic waste keeps being added to the sea?

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Which item takes a longer time to break down than some plastic items?

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Plastic is so affordable for industries to use. Since it is so cheap, plastic becomes a widespread material.	Used plastic that is no longer good to use again will become rubbish. This rubbish will accumulate into bigger piles of rubbish.	Plastic waste ends up on the beaches and it is an eyesore for tourists, often putting them off visiting.	There is not enough profit to be made by companies and therefore plastic wasted is sent to LICs to dispose/recycle.	Many fish humans consume, including brown trout, cisco, and perch, have at one time or another, ingested plastic microfibers
Plastic is now found up to 11km deep in the oceans.	Huge garbage patches have formed on the oceans such as the Great Pacific Ocean Patch.	The likelihood of coral becoming diseased increases from 4% to 89% after coming in contact with marine plastic	Fishing vessels can be damaged by floating debris. It can also destroy fishing nets.	Recycling drinking straws is impossible. Many end up in the landfills and also the oceans.
Trawler nets spend a long time submerged in water which means harmful toxins contaminate the water. They can also break up or get lost in the ocean.	Turtles and other aquatic life can suffer from injuries from plastic. For example plastic can holders can get stuck around their necks.	Many marine organisms can't distinguish plastic items from food. They often starve because they can't digest the plastic, preventing them from eating real food.	As plastic is less expensive it is one of the most widely available and overused items in the world today.	Invisible plastic has been identified in tap water, beer, salt and are present in all samples collected in the world's oceans.
It is estimated that 60% of all seabirds have ingested plastic.	Meals and snacks are wrapped in plastic because it is a considered safer method to preserve the food.	Large amounts of plastic debris have been found in the habitat of critically endangered Hawaiian monk seals, including in areas that serve as pup nurseries.	Whales have washed up on beaches with bellies full of plastic.	Sea turtles are struggling to reproduce.

The Plastic Whale

On 2nd February 2017 a Cuvier's beaked whale was found stranded in shallow waters off the island of Sotra, near Bergen in Norway. It was in such poor condition the wardens decided to put it down.
The creature had very little blubber suggesting the plastic had led it to become malnourished.
Dr Terje Lislevand, a zoologist who studied the whale, said: "The whale's stomach was full of plastic bags and packaging with labels in Danish and English."
He also said the intestines were probably blocked up with plastic, causing severe pain.
The animal had mistaken so many bags for food that its stomach was stuffed with plastic.
This is not the first animal to die because of widespread plastic pollution - and it won't be the last.

Tell the story in your own words

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The 5 ocean gyres

Describe the location of the five Gyres.

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Describe the connection between the Pacific Gyre and the Great Pacific Garbage Patch.

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Using your understanding of the ocean currents explain why the five Gyres are located where they are.

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The ‘Great Pacific Garbage Patch’ is located in the North Pacific Ocean to the west of California between latitudes 35° north and 42° north and longitudes 135° west and 155° west. Study the ways some people have described it and draw a sketch to show how you think it might look according to the statements.

Study the pictures of the real Great Pacific Garbage Patch

How accurate were the statements?

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Make a list of 4 true facts about the patch:

1. ……
2. ……..
3. ……..
4. ……

Summarise with one short sentence what an ‘ocean garbage patch’ is like

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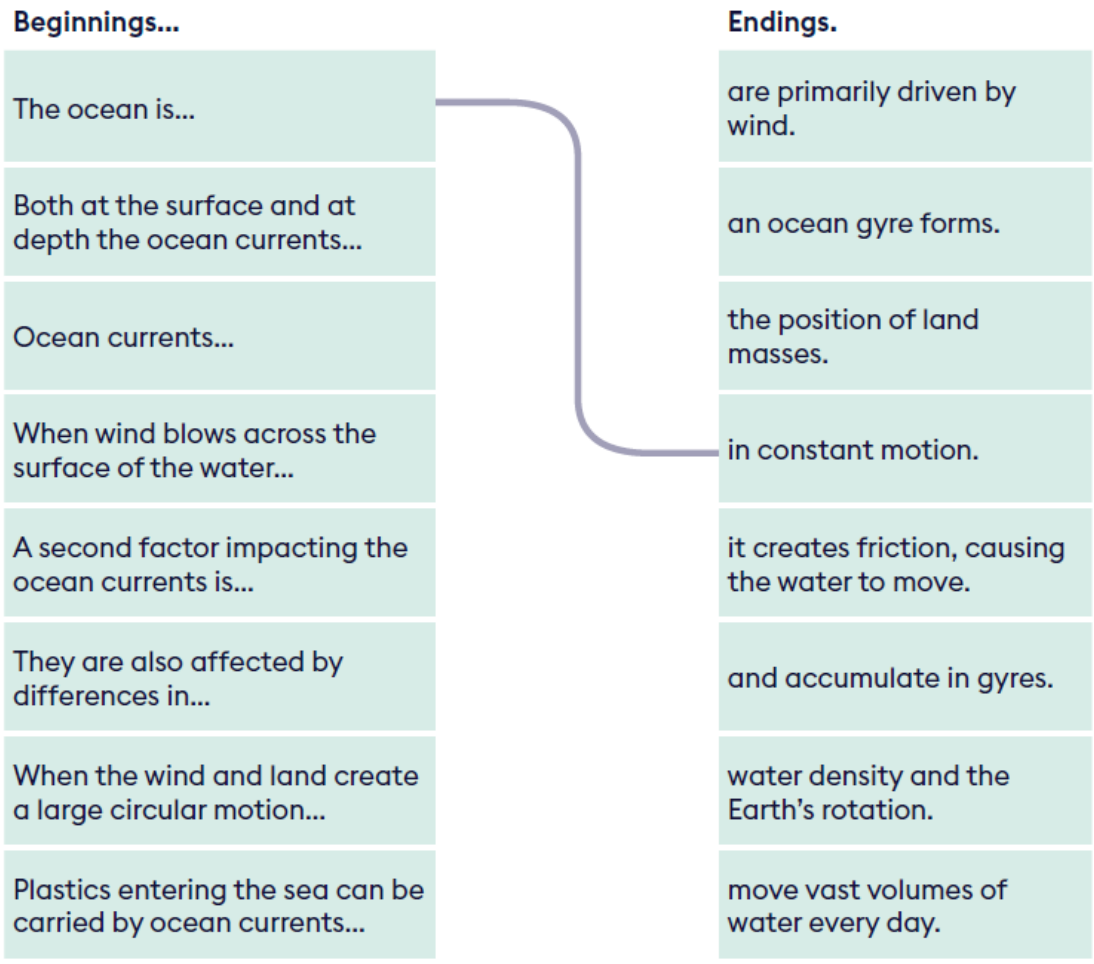

Time to reflect:

List 3 ways humans can affect the oceans

1. .....
2. .....
3. .....

List 2 problems of marine pollution

1. .....
2. .....

List 1 reason why the oceans are so important

.....

Lesson 5: How can we protect our oceans?

Big Picture

L/M/E		I think I can …	My teacher thinks I can …
Learning	I can describe what sustainable fishing is		
Mastering	I can explain what beach clean ups are		
Extending	I can explain how we can reduce our plastic use		

Do now:

Six ways of reducing the plastic pollution problem are:

Redesign, Refuse, Reduce, Repair, Reuse, Recycle

1. What does it mean to recycle plastic waste?

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2. 'Ecover launches bottle made from 50% ocean plastic'. Which of the 6 Rs is this an example of?

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3. You decide to bring a refillable water bottle to school. Which of the 6 Rs is this use describing?

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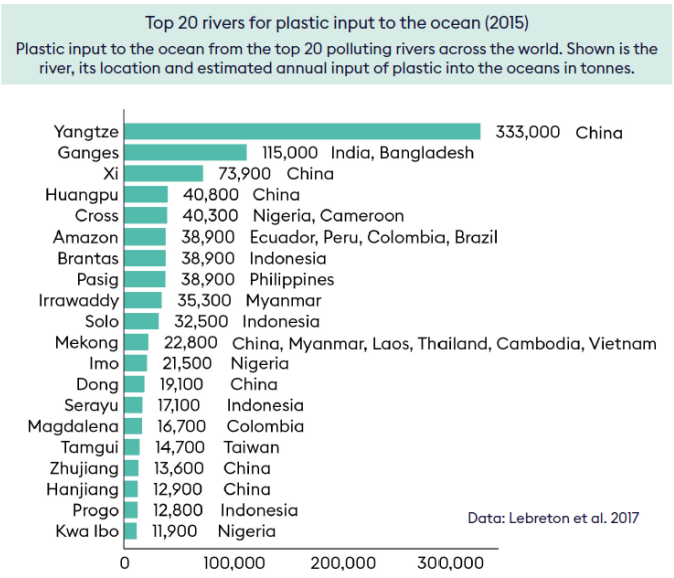
Starter:

Study the graph below and use it to answer the following questions.



Describe the amount of plastic that polluted the ocean from rivers in China

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Identify any patterns in the data

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What factors contribute to the levels of plastic pollution in these rivers?

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Sustainable fishing

Why it is important for us to fish sustainably.

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How might we be able to fish in a sustainable way?

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Video notes:

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Why is this a better method of fishing?

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What are the benefits of sustainable fishing?

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St Lucia – Community based management of ecosystems

1. What are the issues facing marine ecosystems in St Lucia?

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2. Describe the community based management scheme which is used in St Lucia to protect marine ecosystems.

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3. What are the aims of the management scheme?

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Marine Protected Areas

1. What is the purpose of a marine protected area?

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2. What do marine protected areas enable us to do?

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3. Where are marine protected areas located?

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Solving the plastic problem

Make a list of all the things you use plastic for.

In groups of 3 or 4, compare your lists and try to come up with alternative ideas to avoid using plastic

Write your idea next to each item on your list.

Things I use plastic for	Alternatives

Proposed ban on straws and other single-use plastics

How will this affect people every day?

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Would you be happy to stop using plastic straws and single-use plastics? Explain

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Do you think people across the EU would accept this law? Explain

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Do you think this is a good idea? Explain

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Plastic bag charge

How will this affect people every day?

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……

Are you happy to pay for plastic bags?

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Why might it improve the chances of people using bags for life?

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……

How would you use the spare £1billion?

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……..

Which of these can we recycle?

Plastic film from a fruit box	Crisp packet	Plastic takeaway container	Plastic fruit box
Coffee cup	Toothpaste tube	Polystyrene packaging	Yoghurt pot
Plastic bottle	Plastic bag	Bubble wrap	Plastic toys

Beach clean ups

How can beach cleans help?

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Does it solve the problem?

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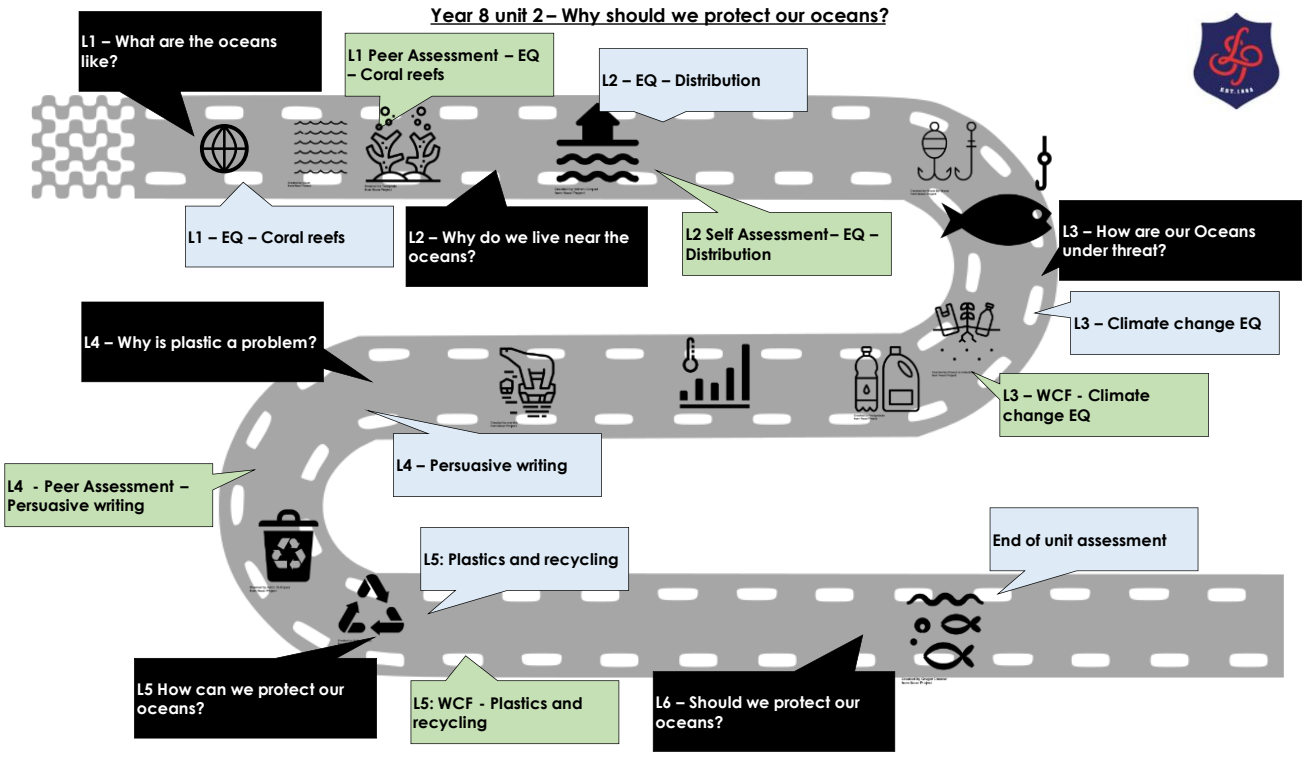
Time to reflect – true or false

It has been estimated that nearly 5 billion plastic straws are thrown away in England each year.	
25% of Europe's plastics are used once and then thrown away.	
There are 39 different recycling schemes in the UK.	
Over half of the councils in the UK recycle plastic bags	
It is ok to make a mistake and put something wrong in the recycling bin.	
You have to wash or rinse all plastic items before you put them in the recycling.	
Black plastic cannot be recycled.	
Symbols like this mean it is recyclable… 	
Approximately 13 billion plastic bottles are used each year in the UK.	
Less than half of plastic bottles are recycled in the UK.	



What have you learned about the Oceans? Top 3 pieces of information	
Why were you studying this topic? Why is it important?	
Out of the 6 lessons in the journey above, which lesson did you learn the most from?	
What is the 1 key message/ fact that you will remember from this topic?	
When we teach this unit again next year, what else do you think we should teach about? What was missing from this unit?	