Topic 1: Hazardous Earth

EQ1: Climate Function and Hazards

Instructions

1. You will need to use either your Kerboodle login, revision guide, the knowledge organisers that are on the ClassCharts post, or the department's website: http://www.fulstonmanorgeoggers.weebly.com

2. You are to read carefully the task set on each page and then complete the task in full sentences where expected.

3. If you get stuck, remember the three Bs – Book, Brain, Boss!

Book - Check your resources first (Kerboodle, revision guide, knowledge organiser, website)

**Brain** – Think it through, you may really already know but are doubting yourself

Boss – email your teacher or message them on ClassCharts

Lesson 1: Global Atmospheric Circulation

Task 1: Read pages 8-13 from your Kerboodle Textbook. If you can't access this, please read over this page from BBC Bitesize (revision pages 1 and 2).

Now, using what you have learnt, label the lines of latitude onto the diagram below.

Equator

Antarctic circle

Tropic of Capricorn

Arctic Circle

Tropic of Cancer
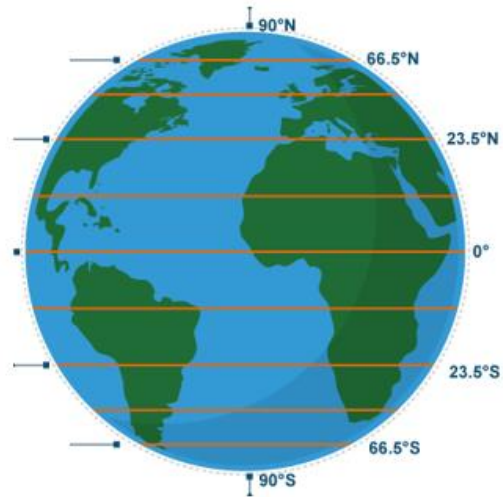
Task 2: In your own words, write a short paragraph to explain the Earth's heat budget (differential heating). Use this video and the diagrams below to help, (with a diagram in your answer to help if needed).

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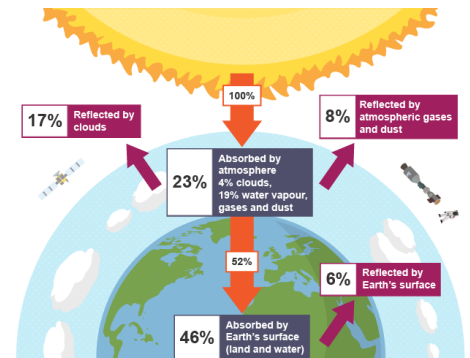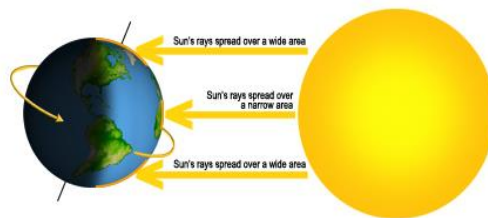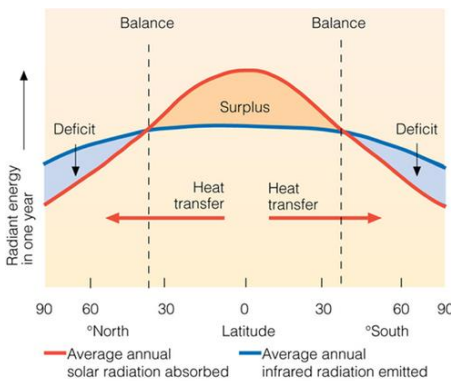
Task 3: Watch this video and create a diagram showing what happens to air movement and weather during high and low pressure. Start with these 2 arrows.
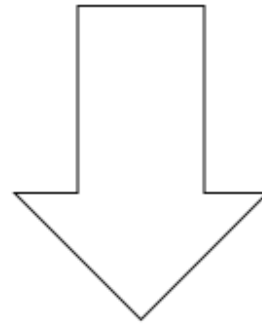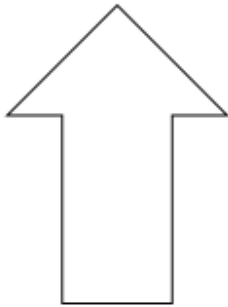
Challenge: look out of your window now – explain which type of air pressure you think we are experiencing. What evidence have you got to support your point?

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Task 4: Watch this video that explains the global atmospheric circulation model. Use your knowledge to fill in the table below to show the differences between the three atmospheric cells.

	Size of cell	Energy in cell	Direction of cell movement	Likely weather in each cell
Hadley				
Ferrel				
Polar				

Now, 'Explain how the atmospheric circulation model distributes heat around the world.'

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Task 5: Watch this video explaining the importance of ocean currents to the global heat circulation. Explain how oceans also help to circulate heat around the world.

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Plenary Challenge: Using your understanding from today's lesson, annotate (label) the map below to show how tropical deserts and areas of high tropical rainfall have been formed.
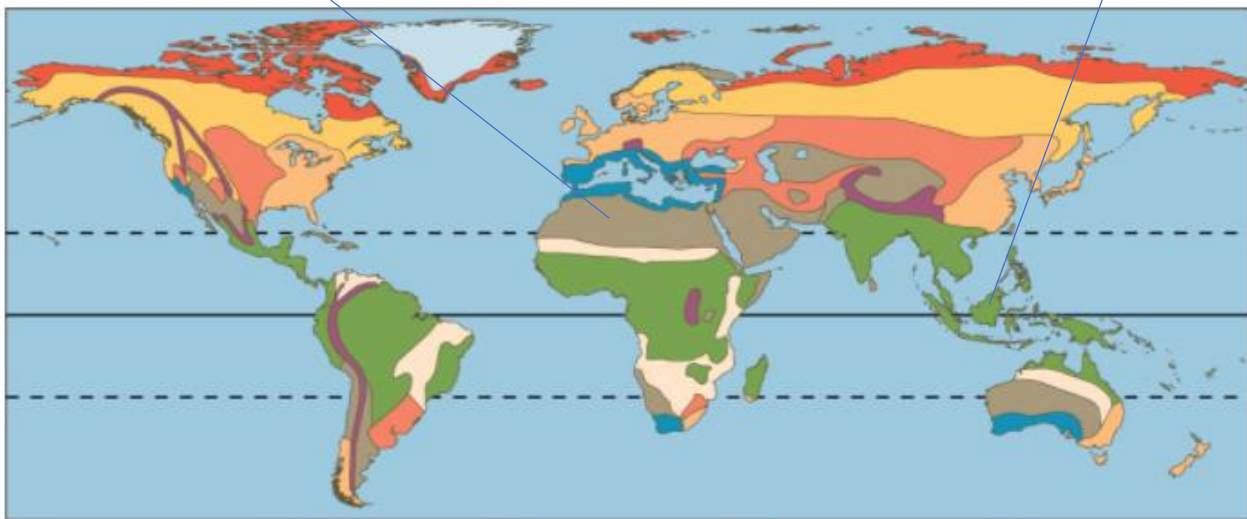
Tropical forest   Savanna   Desert   Chaparral   Temperate forest
Boreal forest   Tundra   Mountains   Polar ice   Temperate grassland

Figure 1. Each of the world's eight major biomes is distinguished by characteristic temperatures and amount of precipitation. Polar ice caps and mountains are also shown.

Need help? Look at this diagram to see if it can support your challenge:
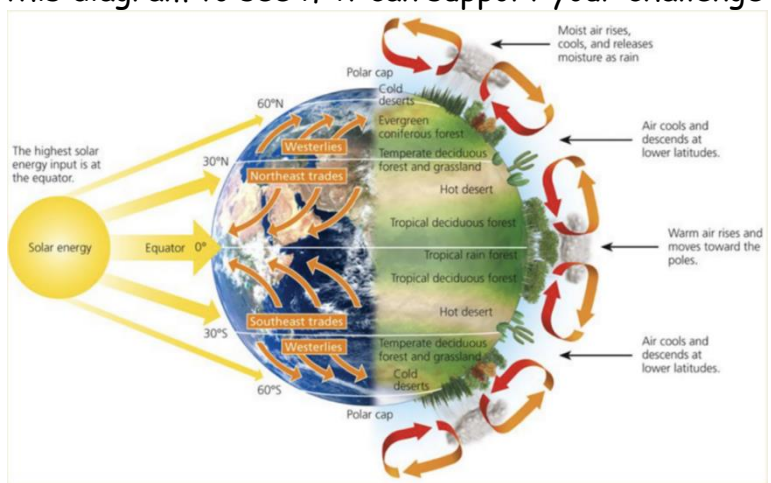
Lesson 2: Evidence of Past Climate Change

Task 1: Read pages 16-19 from the Kerboodle Textbook. If you are stuck, you can use BBC Bitesize (Revision pages 1 and 2).

Now, read this passage and then, below, summarise what we mean by natural climate change.

> Over the last 800,000 years, there have been natural cycles in the Earth's climate. There have been ice ages and warmer interglacial periods. After the last ice age 20,000 years ago, average global temperature rose by about 3°C to 8°C, over a period of about 10,000 years. We can link the rises in temperature over the last 200 years to rises in atmospheric CO2 levels. Rises in temperature are now well above the natural cycle of the last 800,000 years. This all happened WITHOUT human intervention (no additional CO2, pollution etc).

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Task 2: Look at the graph below, which shows the link between CO2 concentrations in the atmosphere, global surface temperatures and global sea levels. This has stacked 3 different graphs together to show a pattern.
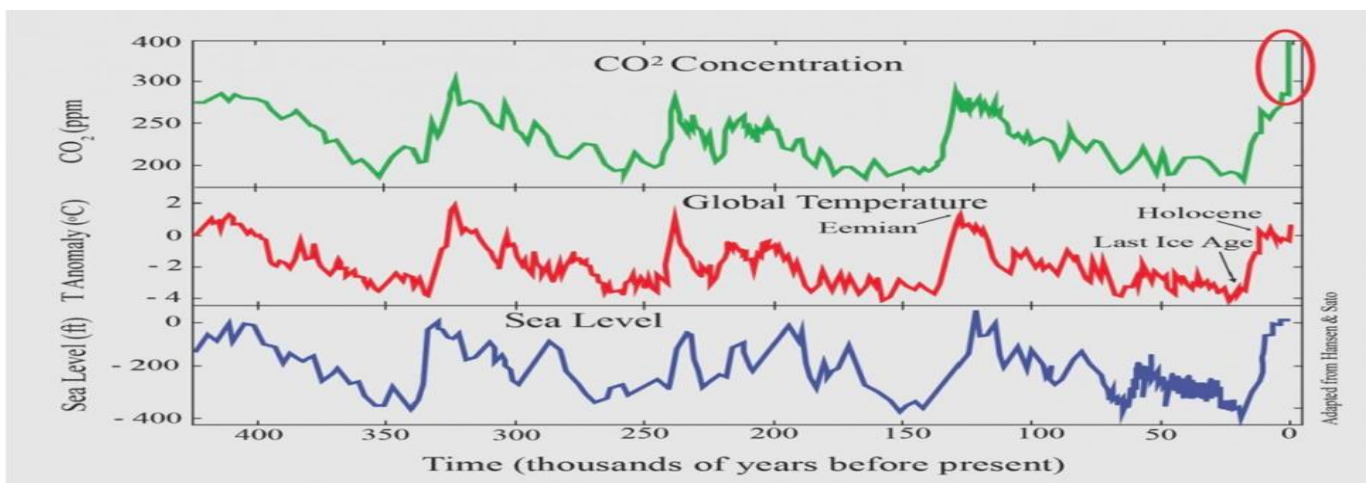
Describe the key trends/patterns you can see over time. Remember to use BETA (beginning, end, trend, anomalies) to help format your answer. Here is your starter sentence:

From the graph it is clear that …

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Task 3: Watch this [video](link) about the evidence for natural climate change. Below, fill in the table to help explain what you now know about those 3 pieces of evidence.

Name of evidence	Description	How does it work?
Ice core sampling		
Tree rings		
Historical records		

Which of these three do you think provides us with the most accurate/useful information about past climate? Justify your choice.

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Task 4: Watch these videos ([1](link), [2](link), [3](link)) about natural causes of climate change. Summarise each of the natural causes below using the mindmap that has been started for you:

Milankovitch Cycles

Volcanic Eruptions

Natural causes of climate change

Impact theory

Sunspot Theory
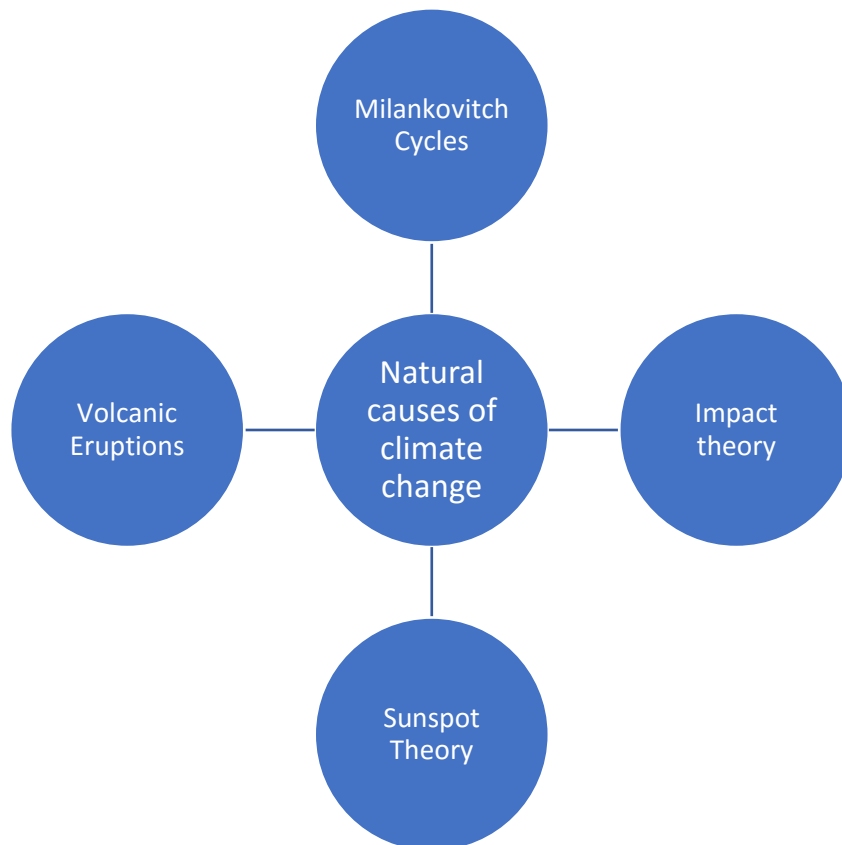
Plenary challenge: Can you colour code these into long, medium and short term causes?

Lesson 3: Causes and impacts of Current Climate Change

Task 1: Read pages 20-23 from the Kerboodle Textbook. If you are stuck and can't use this resource, please use this [BBC Bitesize](#) page instead (pages 3 and 4).

Now, Spot the difference between natural and enhanced greenhouse effects.
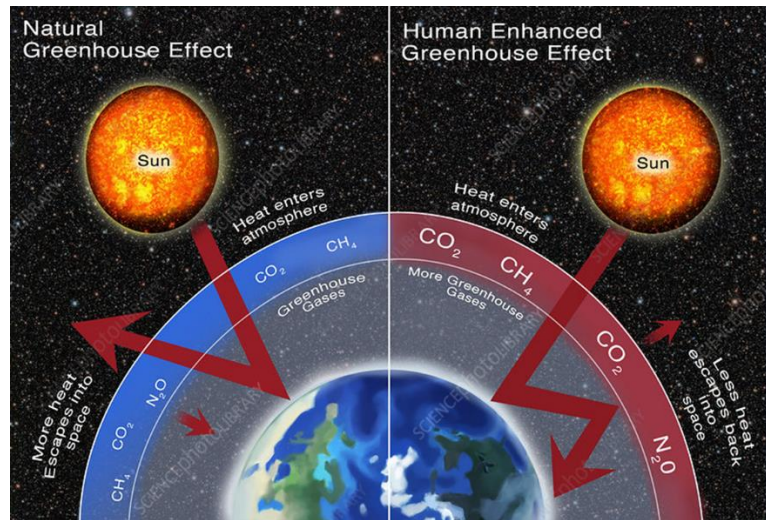
Using the diagram above and your knowledge from the reading, explain how the natural process of the greenhouse effect can be made worse by humans.

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Task 2: Using the greenhouse effect diagram and additional information from this [website](#), draw a diagram to show: 1) Where short wave radiation comes from. 2) Where longwave radiation goes. 3) What the greenhouse gases are doing to the longwave radiation. 4) The final impact of this, for Earth.

Task 3: Watch this video. Now, using your knowledge from the video and your reading, fill in the table below to show the major greenhouse gases, their amounts and where they come from.
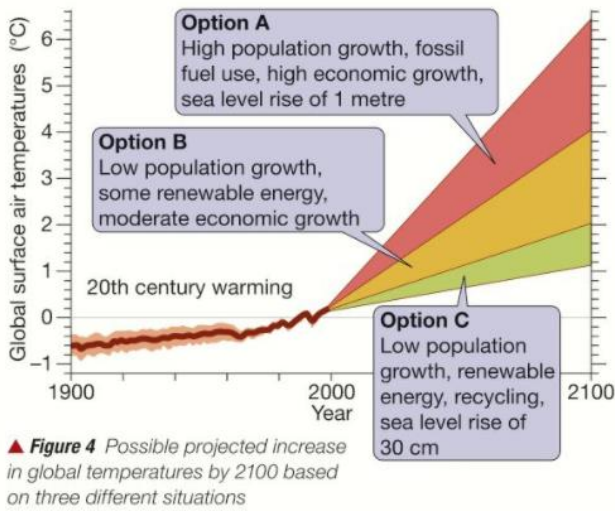
Greenhouse gas	% of greenhouse gases produced	Sources	Warming power compared to CO2	% increase since 1850
Carbon dioxide				
Methane				
Nitrous oxide				
Halocarbons				

Challenge: Can you suggest which greenhouse gas emission we should be most concerned about?

Task 4: Look at the figure below and using your prior knowledge, explain why people in the developing world produce only a small amount of greenhouse gases. Think about their lifestyles and activities compared to the developed world.

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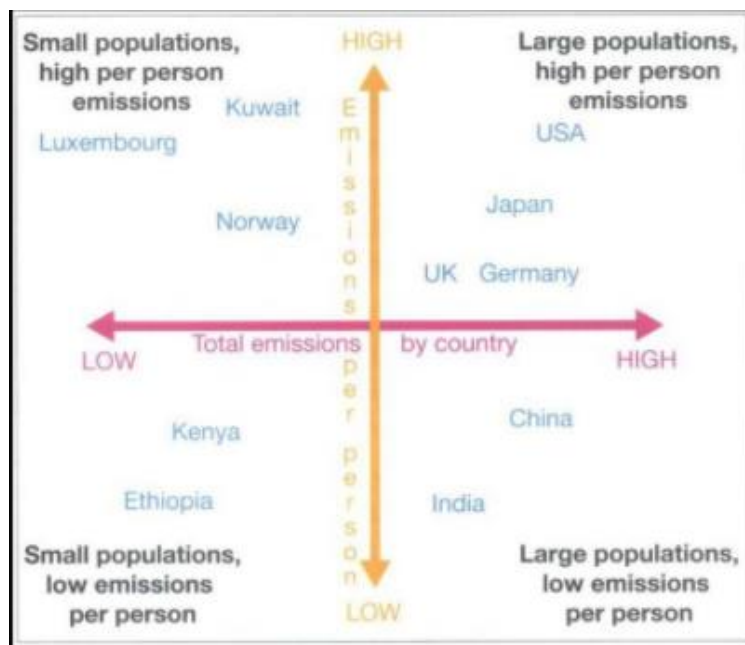
Task 5: Using your knowledge from the reading and the evidence from figure 4 below, describe the predicted changes to global surface temperatures for options a, b and c.

▲ **Figure 4** *Possible projected increase in global temperatures by 2100 based on three different situations*

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b)

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c)

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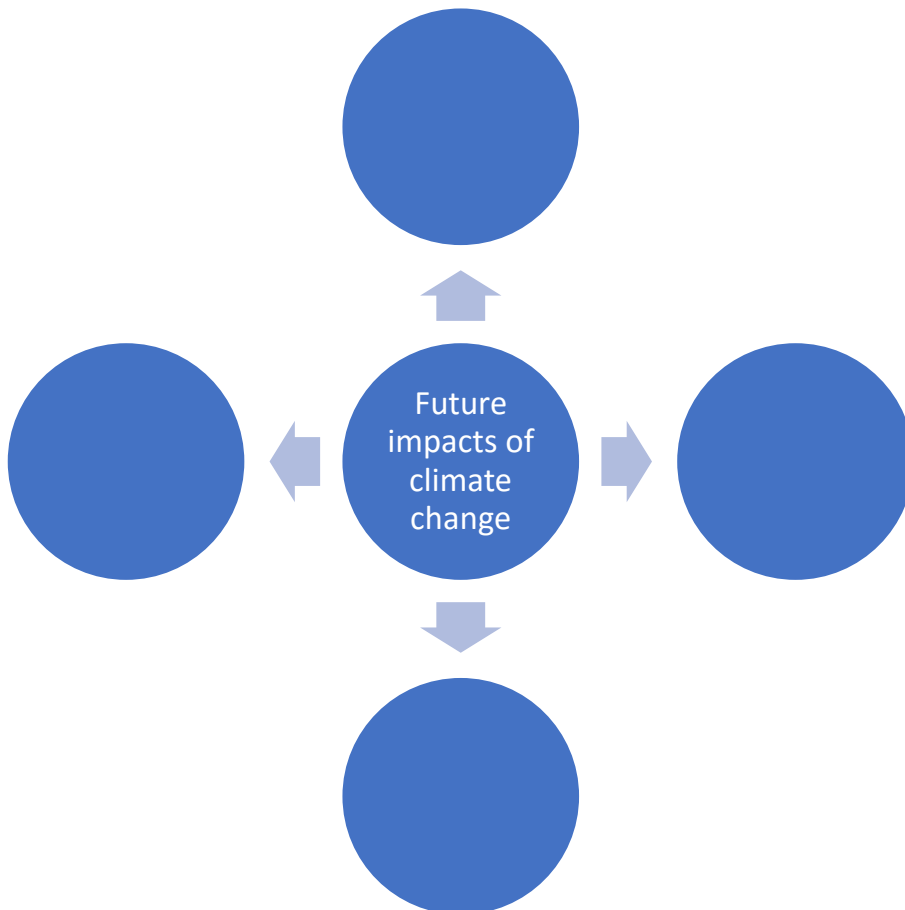**Task 6:** Complete the mindmap below, suggesting what the possible impacts of future climate change could be. *Challenge – can you point to evidence today that proves that some of these predictions are coming true?*

Lesson 4: How do Tropic Cyclones Form?

Task 1: Read pages 24-27 in the Kerboodle textbook. If you cannot access the Kerboodle text, use this BBC Bitesize pages instead (pages 1, 2 and 3 are relevant).

Next, use the map below to describe the distribution of tropical cyclones.
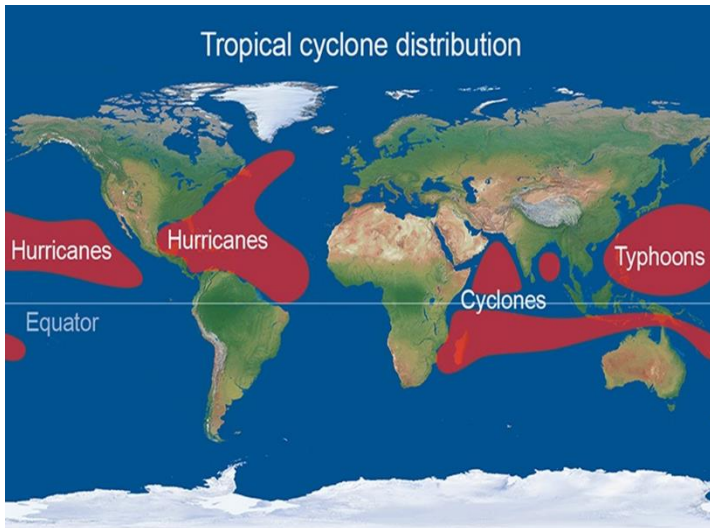
Remember to do the following when describing distribution:

1. Pick out the general trend of location.

2: Give a continent and compass point and name of cyclone (remember from year 8 they can be called hurricanes, typhoons, cyclones and willy willies).

3: Give another continent and compass point and name of cyclone.

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Task 2: Watch these two videos (1 and 2) and read back through the formation of a cyclone from either the Kerboodle pages or the BBC Bitesize pages. Create a step by step drawing below for each part of the process. This should help you recall it, as it needs to be in formation order!

Task 3: Watch this video and analyse the diagrams of tropical cyclones provided in the reading in Kerboodle or BBC Bitesize. Then draw your own cyclone with at least 4 key features to it below.

Task 4: What are the different methods for measuring and classifying tropical cyclones? *Challenge* – can use research to find out what the differences in impacts are between the different Categories of Hurricane using the Saffir-Simpson scale?

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Task 5: Complete the mindmap below to describe the different hazardous impacts of tropical cyclones. *Challenge* – will climate change make any of these impacts worse?

Strong winds

Storm surges

Tropical Cyclone Impacts

Intense rainfall

Landslides
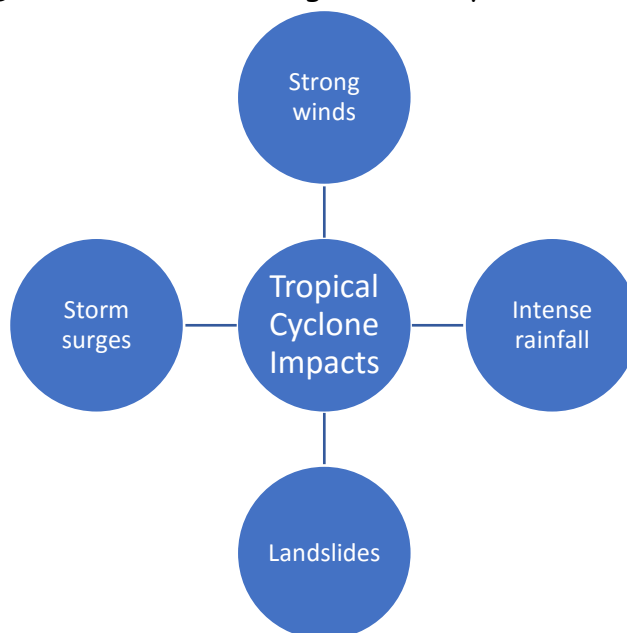
Lesson 5: Why do tropical cyclones sometimes have different impacts depending on where they occur?

Task 1: Read the two case studies from BBC Bitesize ([Typhoon Haiyan](#) and [Hurricane Sandy](#)) and watch these videos ([1](#) and [2](#)) to support your understanding.

Using the table below, compare these case study examples.

Name of case study	Location details	Impacts	Responses
Typhoon Haiyan			
Hurricane Sandy			

Task 2: Now, read pages 30-33 from the Kerboodle textbook. The information across the 4 pages explores the different methods that developing and developed countries can use to prepare for and reduce the impacts of tropical cyclones.

Fill in the table below to describe three methods (at least one developing and one developed – the third is your own choice from across the 4 pages you have read) and evaluate how effective you think each is in protecting a location from the impacts of tropical cyclones.

Method name	How it works	Successes	Challenges	Evaluation (best, worst, in between and why)

Well done! You have completed EQ1 – click on this link to test your knowledge.