Exploring climate change data

1 If your group is new to climate change, introduce the concept. Explain that climate change is the long-term shift in average weather patterns across the world. Since the mid-1800s, humans have contributed to the release of carbon dioxide and other greenhouse gases into the air. This causes global temperatures to rise, resulting in long-term changes to the climate. If you need more information on climate change, you can have a look at the Met Office website **here**

2 Explain that to predict what might happen in the future, scientists first need to understand what has happened in the past. To do this they use historical data about the weather to measure how our climate has changed. Data about our weather is collected all over the world – in our skies, across land and in our oceans. From these data, the Met Office and other research centres, calculate the global surface temperature each month, and each year too. Global surface temperature records are needed to give us the big picture about how our climate is changing. Explain that they are going to have a look at real-life data to learn more about climate change

🕐 20 minutes

👥 Groupwork

🗂 Data cards

3 Split the group into smaller teams and share one of the following examples of real-life global data (on pages 4 to 6). Depending on the time available, you could share one example of real-life data with each team, or 2-3 per team if you have more time.

Three pictures on **here**:

- 2020 Temperature anomalies – map showing how different the annual temperature for 2020 was compared to the average annual temperature between 1981-2010. The warmer colours show that nearly everywhere on Earth was warmer in 2020 than the 30-year average period, particularly northern Asia extending into the Arctic, parts of eastern Europe and Central America. It's important to remember though, this is just one year. To get an understanding of how our climate is changing, you'd need to look at these kinds of maps over a number of years to see the trend

- Global average temperature difference 1850-2020 – timeseries showing the average annual temperature difference for each year from 1850 to 2020 (compared to a baseline of the average annual temperature between 1850 and 1900 which is sometimes called 'pre-industrial'). This is based on the Met Office's dataset called HadCRUT5

- Global mean temperature difference from 1850-1900 – a number of timeseries from different research centres showing the same increase in global mean (average) temperature from 1850 to 2020 compared to that 'pre-industrial' baseline. This shows that despite the datasets being generated from different research centres using different techniques, they're all showing the same warming trend

If they have access to the internet, you can also show them the global surface temperature on the **NASA The Climate Time Machine | NASA Climate Kids**

4 Pose one or more of the following questions to the group (on slide 5 and 6), asking them to discuss in small groups:

- What does the data represent?

- If they just looked at the map for 2020, do they think it would be important to look at maps for other years too?

- Can they think about what the data they have looked at means? They could think about what it means for the globe, for animals and plants, for people.

- Why is it important to make measurements?

- Do they think it's important to have global surface temperature measurements from different research centres?

- How do they think the temperatures will evolve in the future? Will they rise, stay the same or go up and down?

- What other things might scientists need to measure to help us understand climate change? You might want to prompt questions about measuring and monitoring the impacts of climate change as well as the physical changes in our environment.

5 Bring the group together and ask for a few volunteers to share their answers

Optional extension

Explain that some artists have been thinking about how to present climate change data in a more creative way. Show the group **the work of Jill Pelto**. Encourage them to think about how the data is represented in the artist's work using prompt questions such as:

- What kind of data has the artist used?

- How has she incorporated data in her work?

- Is it important to use arts to communicate about science and climate change?

- How is this different to the Met Office data you were looking at earlier?

Tell the group they will create their own data art using one of the real-life data they have been looking at earlier. Encourage them to get creative and think about how they could use the data to communicate about climate change.
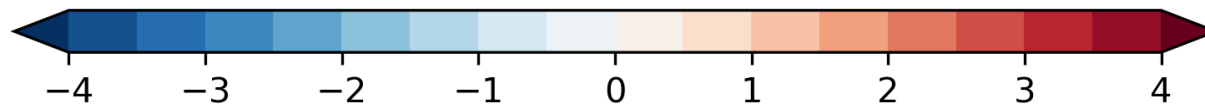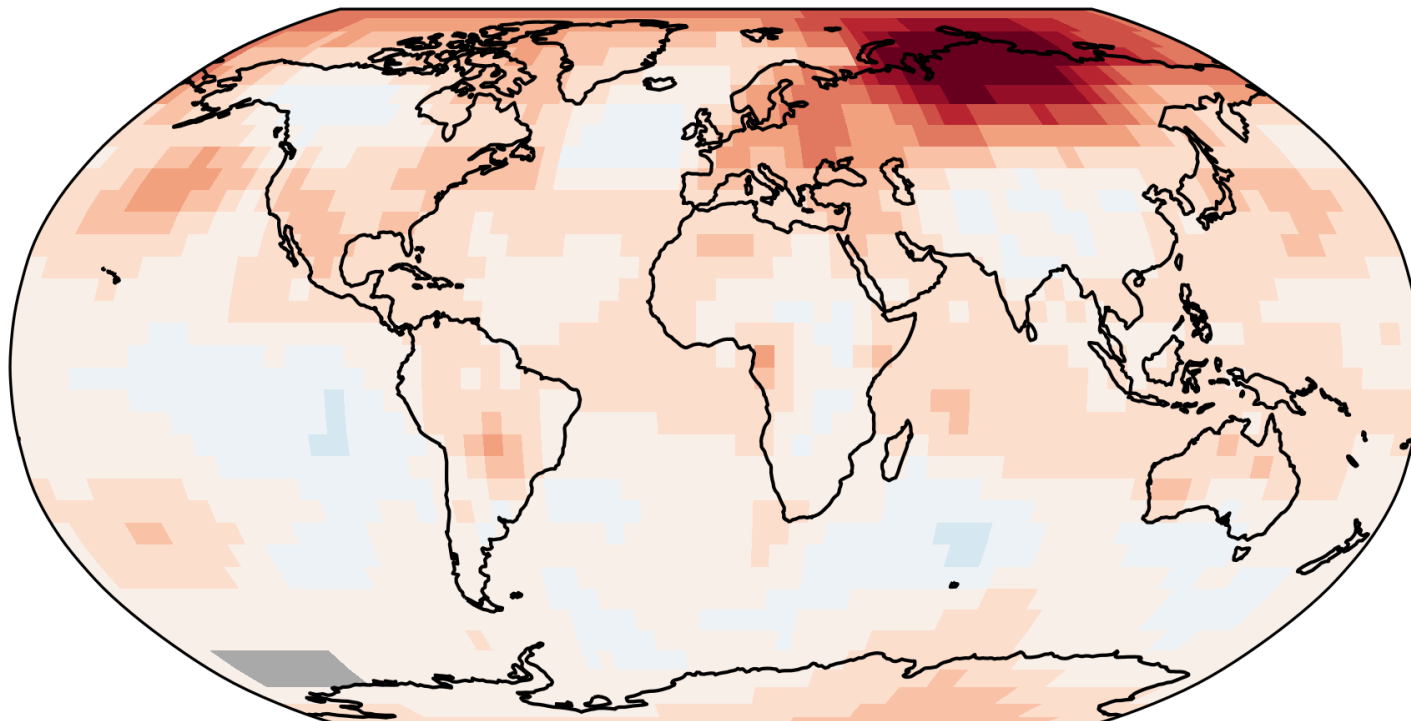
25 minutes

Individual task

Climate change data

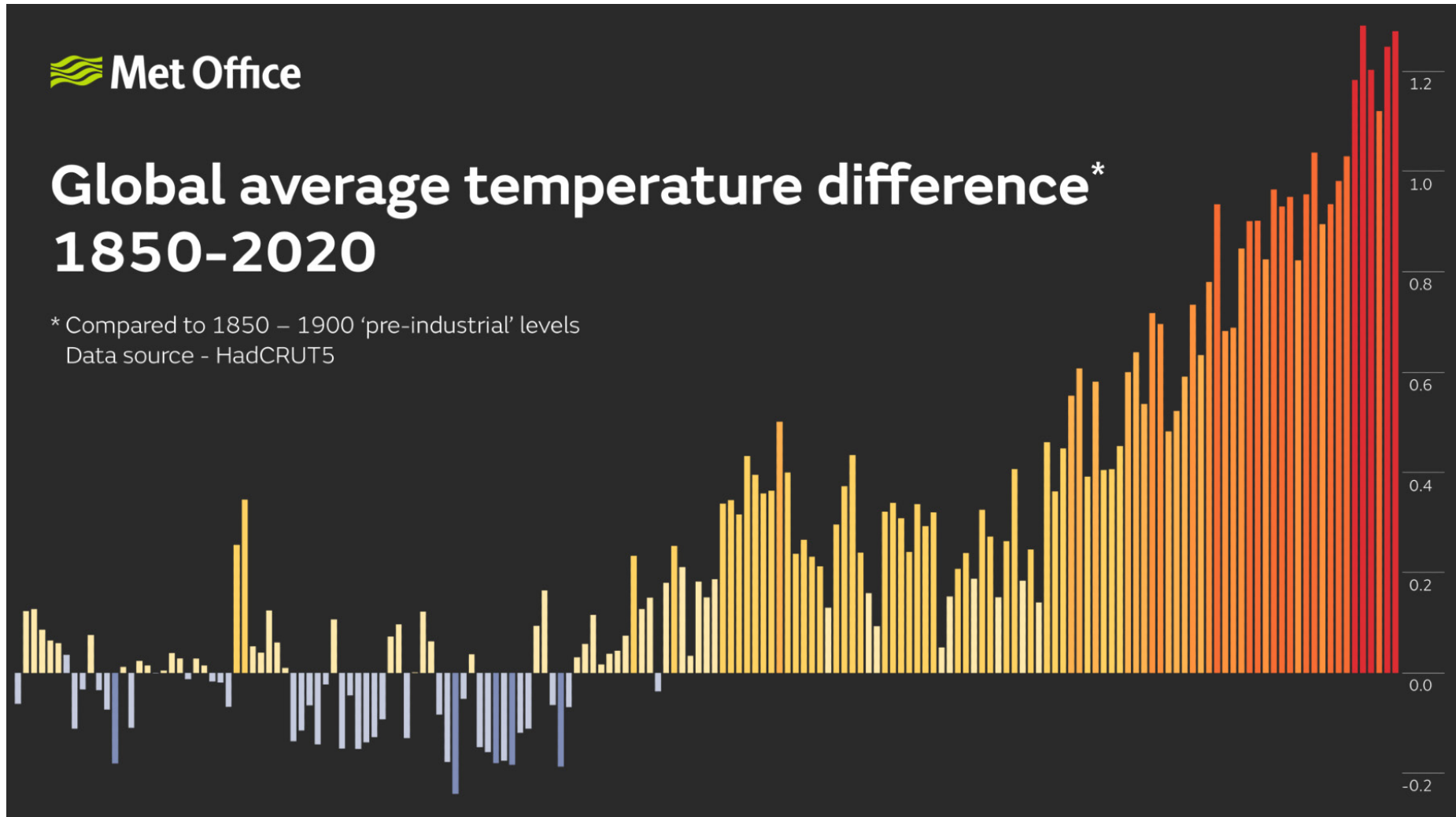Met Office

2020 Temperature Anomalies
based on the HadCRUT5 data set

Temperature difference from 1981-2010 average (°C)

Climate change data

Climate change data

Global mean temperature difference from 1850-1900 (°C)

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