Introduction to Climate

Teachers notes

These lesson objectives are intended for the **KS3 Geography curriculum**, specifically focusing on the topic of **weather and climate**. However, the content can be tailored to suit different key stages, accommodating varying levels of prior knowledge and understanding.

The lesson on Introduction to Climate can be worked through at any pace, and it can be split into multiple lessons if needed. This flexibility allows you to adjust the flow based on the class's understanding and time constraints. If some sections require more in-depth exploration, feel free to extend them over additional lessons to ensure students fully grasp the concepts before moving on.

The worksheets can be filled in during the lesson, as homework, or in individual sections, depending on the pace of the lesson.

Lesson Aim:
To develop an understanding of what climate is, how it differs from weather, while exploring different global climate types and their characteristics.

Lesson Objectives:
- Explain what climate is and how it differs from weather.
- Explore global climate types, differentiate their characteristics and provide examples of locations where each can be found.

Assumed Prior knowledge:
- Students should already understand that different climates exist across the world and be able to describe some of their characteristics. They should also know that weather can change daily, while climate refers to longer-term patterns. Additionally, students should have basic map skills, including the ability to identify countries, continents, and major geographical features, as well as a general awareness of global regions like equatorial, polar, and desert areas.

Resources:
- Lesson 4 worksheet
- Colouring pencils

All the blank worksheets for this lesson can be found as a separate download within the 'Lesson 4' page of the The Flood Hub KS3 Geography Weather and Climate Learning section. The answers for the worksheets can be found at the end of this document.

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Notes for Each Slide:
Teachers should decide what students should copy into their workbooks. While most content is provided on the worksheet, any additional information can be recorded in the workbooks.

Slide 1 - Learning Objectives
- Slide containing the aims and objectives of the lesson. Read these to the class to clarify the focus and expectations for the session.

Slide 2 - Starter Activity
- Ask students to discuss in pairs or small groups what they think climate means, and what makes the climate of the Amazon rainforest different to that of UK?
- **Prompt:** Encourage students to think about what climate means, how it differs from weather, and the factors that influence climate, particularly when comparing the hot, wet climate of the Amazon rainforest with the more temperate climate of the UK.
- Use some examples from student observations to lead into the main topic of the lesson.

Slide 3- What's the difference between weather and climate
- Begin by reminding students of their prior knowledge on weather from previous lessons. Ask them to recall what weather is and give a few examples (e.g., rain, sun, wind).
- Then, introduce the definition of climate, emphasising that it refers to the average atmospheric conditions over a longer period (usually 30 years or more), rather than short-term, daily variations like weather.
- Reinforce the key difference: weather is what you see outside today, climate is what you expect over many years.

Slide 4- Climate definition Activity
- Ask students to complete the task on their worksheets.
- **TASK:** fill in the blanks to complete the definition of climate.

Slide 5 - Climate definition
- Go over the definition with the class to ensure everyone has the correct notes down.

Slide 6 - Climate vs weather activity
- Read the statements or instruct students to read each statement on their worksheet and decide whether it describes climate or weather. You can either do this as a class discussion or have students complete it individually and then share answers. Remind them that climate refers to long-term patterns, while weather describes short-term conditions.
- **TASK**: Use two colours to highlight or underline the statements—one for climate and one for weather.

Slide 7 - Climate vs weather activity answers
- Go through the answers as a class, asking students to explain why each statement refers to climate or weather. The answers are either on the slide or in the teacher's version of the worksheet at the end of the notes.
- Clarify any uncertainties and encourage discussion around the examples to ensure all students are on the same page.

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Slide 8 - Global Climate Types

- Explain that the factors we've discussed (latitude, altitude, ocean currents, continentality, and atmospheric circulation) all work together to shape the different climate zones found around the world.
- Ask students, "Can you name any climate types?" Encourage them to think about places they've learned about or have visited.

Slide 9- Polar Climate

- Explain that polar climates are cold and dry, found in the far north and south of the planet. Some polar regions are covered in ice, while others have tundra vegetation. Use examples like Antarctica, Greenland, the Arctic regions of Canada, Northern Alaska, Siberia in Russia, Northern Norway, and Iceland to help students visualise where these climates are located.

Slide 10- Polar Climate

- Describe tundra vegetation, which refers to the hardy, low-growing plants, such as mosses, lichens, and dwarf shrubs, that can thrive in the cold, dry conditions of the tundra biome. Emphasise how this biome is defined by short growing seasons and permafrost, which is permanently frozen ground beneath the surface.

Slide 11- Temperate Climate

- Temperate Climate, which is characterised by moderate temperatures and four distinct seasons—spring, summer, autumn, and winter. Explain that the summers are typically mild to warm, while the winters are cool to cold. There is varying precipitation throughout the year, making the temperate climate one of the most balanced in terms of weather patterns.
- Provide examples of regions with a temperate climate, such as the United Kingdom, Germany, France, Japan, and New Zealand.

Slide 12- Desert / Arid Climate

- Desert/Arid Climate, which is typically found along the Tropics of Cancer and Capricorn. Explain that these regions receive less than 250 millimetres of rainfall annually, resulting in high daytime temperatures, cooler nights, and limited vegetation.
- Discuss how arid climates are often home to drought-resistant plants, such as cacti and shrubs, which are adapted to survive in the extreme conditions.
- Provide examples of desert regions, including the Sahara Desert, Atacama Desert, Great Victoria Desert, Kalahari Desert, Gobi Desert, Namib Desert, Chihuahuan Desert, and Thar Desert.

Slide 13 - Tropical Climate

- Introduce the Tropical Climate, which is typically hot and often experiences high levels of rainfall, especially in regions near the Equator. Explain that in these areas, warm air rises, leading to significant precipitation. This creates ideal conditions for tropical rainforests to thrive in the humid environment.
- Provide examples of regions with a tropical climate, such as the Amazon Rainforest, Congo Basin, Indonesia, Malaysia, Costa Rica, Panama, Cuba, Jamaica, Northern Australia, Southern Florida, Madagascar, Sri Lanka, and the Philippines.

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Slide 14 - Mountain Climate

- Introduce the Mountain Climate, which consists of colder climates found at high altitudes. These climates can be found anywhere on the planet, with temperature and conditions becoming harsher as you go higher up. Explain that above the tree line, only small plants such as grasses and mosses can survive due to the extreme cold and lack of oxygen.
- Provide examples of regions with mountain climates, such as the Andes (South America), the Himalayas (Asia), the Rockies (North America), the Alps (Europe), and the Atlas Mountains (North Africa).

Slide 15 - Mediterranean Climate

- Introduce the Mediterranean Climate, which is found in warm coastal regions between 30˚ and 45˚ north and south of the Equator. Explain that this climate is characterised by hot, dry summers and milder, wetter winters, with most of the rainfall occurring during the winter months.
- Discuss how this climate supports a diverse range of vegetation, including shrubs, grasses, and drought-resistant trees. Mention how the ability of plants to survive dry conditions is key in Mediterranean climates.
- Provide examples of regions with a Mediterranean climate, such as California, Southern Spain, Italy, Greece, Turkey, South Australia, Chile, Southwest South Africa, Portugal, and Algeria.

Slide 16 - Global Climate Types Activity

- TASK: match each global climate type with its characteristics and example locations.
- This task will help them solidify their understanding of the key climate zones we've discussed in the lesson. They should focus on remembering the main features of each climate and where these climates are found around the world.

Slide 17 - Global Climate Types Activity Answers

- Once the students have completed the matching exercise on their worksheets, go through the answers as a class. Discuss each climate type, its characteristics, and the example locations to ensure that everyone understands the key differences.

Slide 18 - Global climate types map

- Explain the global map of the different climate types. Inform them that there is a blank copy of this map on their worksheets, and for their homework, they should colour it in to show how the climate types are distributed around the globe.
- Encourage them to use different colours for each climate type (e.g., blue for tropical, orange for desert, green for temperate, etc.), and to refer to the climate information we've discussed during the lesson to accurately place the climate zones. This task will help them visually reinforce where each climate type is found and understand the global distribution of climates.

Slide 19 - Global Climate types Clear Map

- On the next slide, students will see the blank map for their homework task.

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Fill in the blanks: *rainfall, 30 years, average atmospheric conditions, typical conditions, long period,*

Climate refers to the *average atmospheric conditions*, such as temperature and *rainfall*, in a specific location. It is determined by observing these conditions over a *long period*, typically around *30 years*. Climate provides us with an understanding of the *typical conditions* we can expect in that area.

Colour code the statements into weather or climate: Weather Climate

The Sahara Desert is hot and dry, with very little rainfall throughout the year.	It rained all day yesterday, but today it's sunny and warm.	In the UK, it's typically mild and wet throughout the year.
There was a sudden thunderstorm this afternoon that lasted an hour.	In Spain, summers are generally warm and dry.	What is happening outside right now. The conditions can differ rom day to day.
The heatwave last week caused temperatures to soar above 35˚C for several days.	A description of the typical conditions in an area over a long period of time.	In tropical rainforests, it's usually hot and humid, with heavy rainfall throughout the year.

Match the climate type to its description and examples:

Climate Type	Characteristics	Example locations
Polar	Moderate temperatures and four distinct seasons—spring, summer, autumn, and winter—typically with mild to warm summers and cool to cold winters with varying amounts of precipitation throughout the year.	Antarctica, Greenland, Arctic regions of Canada, Northern Alaska, Siberia, Russia, Northern Norway, Iceland...
Temperate	Warm coastal regions located between 30˚ and 45˚ north and south of the Equator, featuring hot, dry summers and milder, wetter winters, with moderate rainfall occurring primarily during the winter months. This climate supports a diverse range of vegetation, including shrubs, grasses and drought-resistant trees.	Amazon Rainforest, Congo Basin, Indonesia, Malaysia, Costa Rica, Panama, Jamaica, Northern Australia, Madagascar, Sri Lanka, Philippines...
Arid / Desert	Typically hot and often experience high levels of rainfall, particularly in regions near the Equator. In these areas, warm air rises, resulting in significant precipitation. Tropical rainforests thrive in these humid conditions.	The Andes, The Himalayas, The Rockies, The Alps, The Atlas Mountains, The Pyrenees
Tropical	Cold, dry climates found in the far north and south of the planet. Some polar regions are covered in ice and others have tundra vegetation.	Southern Spain, Italy, Greece, Turkey, South Australia, Portugal, Algeria....
Mountain	These regions receive less than 250 millimetres of rainfall annually, resulting in high daytime temperatures, cooler nights, and limited vegetation. Arid climates often featuring drought-resistant plants like cacti and shrubs.	United Kingdom, Germany, France, Japan, New Zealand....
Mediterranean	Colder climates at high altitudes, which can be found anywhere on the planet. Only small plants, such as grasses and mosses, can survive above the tree line.	Sahara Desert, Atacama Desert, Great Victoria Desert, Gobi Desert, Chihuahuan Desert, Thar Desert...

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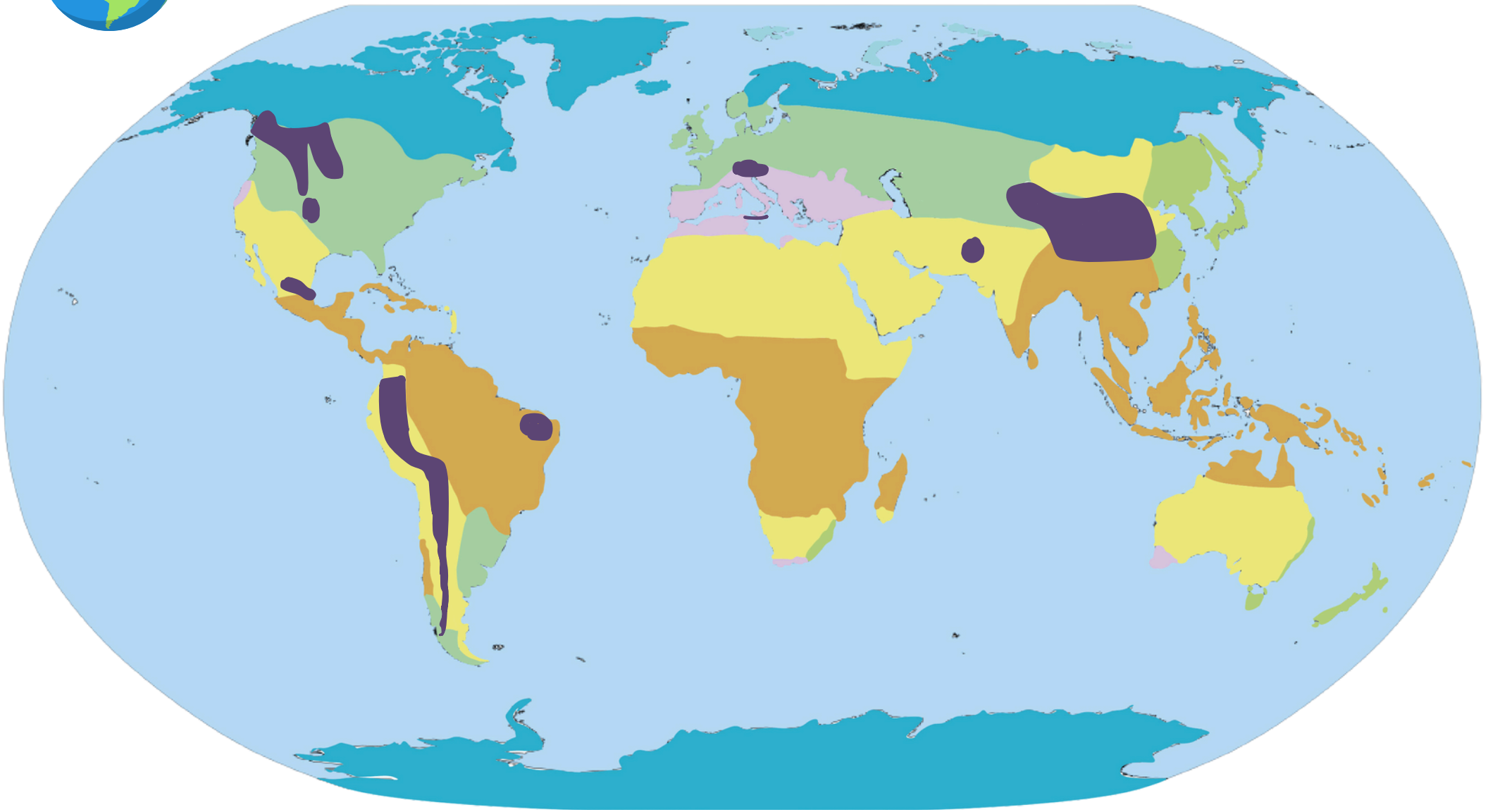

Polar
Temperate
Desert / Arid
Tropical
Mediterranean
Mountain