

## 1.2 CLIMATE ZONES

### What do climate patterns across Germany and its neighbors reveal about natural environments in those regions?

<p><b>C3 Framework Indicator</b></p>	<p><b>D2.Geo.2.6-8.</b> Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions, and changes in their environmental characteristics.</p> <p><b>D2.Geo.5.6-8.</b> Analyze the combinations of cultural and environmental characteristics that make places both similar to and different from other places.</p> <p><b>D2.Geo.8.6-8.</b> Analyze how relationships between humans and environments extend or contract spatial patterns of settlement and movement.</p>	
<p><b>Staging the Compelling Question</b></p>	<p>After reviewing the concepts of latitude and longitude, students will apply their understanding by using the coordinates on a map to find various locations across Germany and explain the climate zones.</p>	
<p><b>Supporting Question 1</b></p> <p>What can the latitude and longitude of a place reveal about the climate?</p>	<p><b>Supporting Question 2</b></p> <p>How does exploring latitude, longitude, climate, and vegetation enhance our understanding of a region?</p>	<p><b>Supporting Question 3</b></p> <p>How does climate impact the way people interact or adapt to their environment?</p>
<p><b>Formative Performance Task</b></p> <p>Students will find the latitude and longitude of each city listed in the handout. Students will then list the climate zone of each city on the chart.</p>	<p><b>Formative Performance Task</b></p> <p>Using the resources, students will complete the Map Challenge: Climate Zones of Germany and Neighbors.</p>	<p><b>Formative Performance Task</b></p> <p>Students will use sticky note clues and maps to find the country being described in the handout.</p>
<p><b>Featured Sources</b></p> <p><b>Source A:</b> Handout 1.2.1</p> <p><b>Source B:</b> Handout 1.2.2</p> <p><b>Source C:</b> Germany Climate Zones Map</p> <p><b>Source D:</b> Germany Latitude Longitude Map</p>	<p><b>Featured Sources</b></p> <p><b>Source A:</b> Handout 1.2.3</p> <p><b>Source B:</b> Handout 1.2.4</p> <p><b>Source C:</b> Germany Latitude Longitude Map</p> <p><b>Source D:</b> Germany Climate Zones</p> <p><b>Source E:</b> Major Climate Regions of Europe</p> <p><b>Source F:</b> Vegetation Zones - Europe</p>	<p><b>Featured Sources</b></p> <p><b>Source A:</b> Handout 1.2.5</p> <p><b>Source B:</b> Handout 1.2.6</p> <p><b>Source C:</b> Handout 1.2.7</p> <p><b>Source D:</b> Europe Latitude Longitude Map</p> <p><b>Source E:</b> Major Climate Regions of Europe</p> <p><b>Source F:</b> Vegetation Zones - Europe</p>
<p><b>Summative Performance Task</b></p>	<p><b>Argument:</b> Construct an argument (e.g., detailed outline, poster, essay) that addresses the compelling question using specific claims and relevant evidence from historical or contemporary sources while acknowledging competing views.</p> <p><b>Extension:</b> Expand on the Map Challenge or increase the rigor by adding scenario-type questions that incorporate comparisons of climate with physical land features into the questions.</p>	
<p><b>Taking Informed Action</b></p>	<p><b>Understand:</b> Learning about the environmental factors of a region is vital to learning how people live in that region.</p> <p><b>Assess:</b> Explore environmental features—climate, vegetation, crops—in your state.</p> <p><b>Act:</b> Create a display (e.g., a map) that illustrates the impact of climate and vegetation on how people live in your state.</p>	

## ❓ COMPELLING QUESTION

- What do climate patterns across Germany and its neighbors reveal about natural environments in those regions?

### INQUIRY OVERVIEW

After reviewing the concepts of latitude and longitude, students will apply their understanding by using the coordinates on a map to find various locations across Germany and compare those locations with Germany's neighbors. Their comprehension will be further challenged in an activity designed to use higher-level thinking skills through a Map Challenge activity.

### TEACHER BACKGROUND

Latitude and longitude help us to identify the absolute location of places. The basics of latitude and longitude in this inquiry will be useful in determining where places are located in Germany, as well as the environmental factors that influence its climate. The Equator is the line of 0° latitude. Each parallel measures 1° north or south of the Equator, with 90° north of the Equator and 90° south of the Equator. Latitude is the most significant factor when assessing the condition of a location's climate. Longitude (meridians) are measures which run north or south, converging at the north and south poles. The 0° line of longitude (prime meridian) passes through the Royal Observatory in Greenwich, England. Longitude lines run from 0° to 180° east, and from 0° to 180° west.



Situated in Western Europe, Germany has a temperate climate with cool winters and warm summers. Daily average temperatures in the summer range between 72 and 77°F (22 and 25°C), and between 27 and 40°F (–3 and 4°C) in the winter months. From the high elevations in the Alps in the south of the country, the landscape flattens to a vast plain, known as the North German Plain, which sprawls out all the way to the Baltic and North Seas. In the coastal areas, as well as the western regions, an oceanic climate is predominant. Cities in the north, like Hamburg, Bremen, and Rostock, are rainier than those in the south, but also enjoy milder temperatures in the winter due to their proximity to the Atlantic Ocean and the North Atlantic Current. The eastern and central regions in Germany display a continental climate. Southern *Länder* bordering the Alps, like Bavaria and Baden-Württemberg, have a mountainous or alpine climate. Though they have warmer summers, their winters can be more unpredictable with cold air from the north and east as well as more regular snowfall. Extremely high or low temperatures are rare, though in the summer of 2019 the temperatures soared to 108°F (42°C).

Germany can be divided into three broad natural regions: the North German Plain, the Central Uplands, and the Alps. Vegetation varies, with forests being more abundant in the south, and salt marshes and reed beds in the north. The coast is home to wading birds and other sea life, whereas the mountains and forests are home to boar, ibex, and wildcats.

In comparison to other countries in the European Union (EU), like Spain and Italy, Germany is less rich in biodiversity. Over 50 percent of Germany's land is used for agricultural purposes (such as growing crops and farming), about 15 percent of its territory is built-up land (residential, commercial, industrial buildings), and around 30 percent of the land is covered in deciduous broadleaf forests. Of these forests, 90 percent are made up of only eleven types of trees. The most common species of trees are the European Spruce, European Red Pine, European Beech, and Sessile Oak. The proportion of deciduous trees is slightly lower than that of conifers. The most well-known forest in Germany is the Black Forest.

### ► Sources

- Deutsche Wildtier Stiftung. (2021). Baumarten in Deutschland. <https://tinyurl.com/3jut5v6d>.
- DeStatis. (2021). Land Use Germany. [https://www.destatis.de/EN/Themes/Economic-Sectors-Enterprises/Agriculture-Forestry-Fisheries/Land-Use/\\_node.html](https://www.destatis.de/EN/Themes/Economic-Sectors-Enterprises/Agriculture-Forestry-Fisheries/Land-Use/_node.html).

 **TIME:** One or two 45-minute class periods

## INSTRUCTIONAL RESOURCES

- German Cities Worksheet (**Handout 1.2.1**)
- German Cities Worksheet Answer Key (**Handout 1.2.2**)
- Map Challenge: Climate Zones of Germany and Neighbors (**Handout 1.2.3**)
- Map Challenge: Climate Zones of Germany and Neighbors Answer Key (**Handout 1.2.4**)
- Sticky Note Clues (**Handout 1.2.5**)
- Sticky Note Clues Answer Key (**Handout 1.2.6**)
- Sticky Note Template (**Handout 1.2.7**)
- Encyclopedia Britannica Inc. Major Climate Regions of Europe. Retrieved January 15, 2021, from <https://www.britannica.com/place/Europe/images-videos#/media/1/195686/228157>.
- Encyclopedia Britannica Inc. Vegetation Zones – Europe. Retrieved January 15, 2021, from <https://www.britannica.com/place/Europe/Plant-life#/media/1/195686/145418>.
- European Commission. (n.d.). Germany Climate Zones. [PDF]. [https://forest.jrc.ec.europa.eu/media/filer\\_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu\\_climate.pdf](https://forest.jrc.ec.europa.eu/media/filer_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu_climate.pdf).
- MapsofWorld.Com. (2020, February 21). Europe Latitude Longitude Map. Retrieved January 15, 2021, from [https://www.mapsofworld.com/lat\\_long/europe.html](https://www.mapsofworld.com/lat_long/europe.html).
- MapsofWorld.Com. (2020, February 25). Germany Latitude Longitude Map. [https://www.mapsofworld.com/lat\\_long/germany-lat-long](https://www.mapsofworld.com/lat_long/germany-lat-long).



## INTRODUCTORY QUESTION

Display the climate zone map of Germany and tell students to imagine that they are taking a trip. Briefly describe what type of climate each color represents and/or give a general overview of the different types of climate in Germany. Ask students to select an area they would like to visit and to write down five or six clothing items they would need to pack for their trip and why they would need those items of clothing. This can lead to a further discussion about the importance of understanding a region's climate.

### ► Resources

- European Commission. (n.d.). Germany Climate Zones. [PDF]. [https://forest.jrc.ec.europa.eu/media/filer\\_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu\\_climate.pdf](https://forest.jrc.ec.europa.eu/media/filer_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu_climate.pdf).

## ❓ SUPPORTING QUESTION 1

***What can the latitude and longitude of a place reveal about the climate?***

### ► Formative Performance Task

Using the German Cities Worksheet (**Handout 1.2.1**), students should find the latitude and longitude of each city listed, or if the latitude and longitude are already provided, find the corresponding city. Teachers should model how to locate latitude and longitude to find cities, and vice versa.

Students should then list the climate zone of each city on the chart. If time allows, hold a follow-up discussion about climate patterns across Germany.

### ► Resources

- German Cities Worksheet (**Handout 1.2.1**)
- German Cities Worksheet Answer Key (**Handout 1.2.2**)
- European Commission. (n.d.). Germany Climate Zones. [PDF]. [https://forest.jrc.ec.europa.eu/media/filer\\_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu\\_climate.pdf](https://forest.jrc.ec.europa.eu/media/filer_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu_climate.pdf).
- MapsofWorld.Com. (2020, February 25). Germany Latitude Longitude Map. [https://www.mapsofworld.com/lat\\_long/germany-lat-long.html](https://www.mapsofworld.com/lat_long/germany-lat-long.html).

## ? SUPPORTING QUESTION 2

*How does exploring latitude, longitude, climate, and vegetation enhance our understanding of a region?*

### ► Formative Performance Task

Using an atlas or the maps listed in resources that show the latitude, longitude, and climate zones for Germany or Europe, students, either independently or in pairs or groups, should complete the Map Challenge: Climate Zones of Germany and Neighbors (**Handout 1.2.3**).

Based on the students' learning needs, the teacher may model how to complete questions on the Map Challenge worksheet.

### ► Resources

- Map Challenge: Climate Zones of Germany and Neighbors (**Handout 1.2.3**)
- Map Challenge: Climate Zones of Germany and Neighbors Answer Key (**Handout 1.2.4**)
- Encyclopedia Britannica Inc. Major Climate Regions of Europe. Retrieved January 15, 2021, from <https://www.britannica.com/place/Europe/images-videos#/media/1/195686/228157>.
- Encyclopedia Britannica Inc. Vegetation Zones – Europe. Retrieved January 15, 2021, from <https://www.britannica.com/place/Europe/Plant-life#/media/1/195686/145418>.
- European Commission. (n.d.). Germany Climate Zones. [PDF]. [https://forest.jrc.ec.europa.eu/media/filer\\_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu\\_climate.pdf](https://forest.jrc.ec.europa.eu/media/filer_public/a4/0c/a40caba9-1269-4b23-817f-594b81149ee5/deu_climate.pdf).
- MapsofWorld.Com. (2020, February 25). Germany Latitude Longitude Map. [https://www.mapsofworld.com/lat\\_long/germany-lat-long](https://www.mapsofworld.com/lat_long/germany-lat-long).

## ? SUPPORTING QUESTION 3

*How does climate impact the way people interact or adapt to their environment?*

### ► Formative Performance Task

Use the Sticky Notes Clues (**Handout 1.2.5**) to print sticky notes for each student with clues about the different types of climate and vegetation found across Europe. If needed, use the Sticky Note Template (**Handout 1.2.7**) to add more clues.

Give each student a Sticky Note Clue from **Handout 1.2.5**. Display the Europe Latitude Longitude Map. Using the maps listed in resources, students should find the country that is described in their clue and place their sticky notes appropriately.

If time allows, lead a discussion about the ways people might live in or adapt to their country based on environmental factors.

Note: Some clues may have more than one correct placement on the map.

### ► Resources

- Sticky Note Clues (**Handout 1.2.5**)
- Sticky Note Clues Answer Key (**Handout 1.2.6**)
- Sticky Note Template (**Handout 1.2.7**)
- Encyclopedia Britannica Inc. Major Climate Regions of Europe. Retrieved January 15, 2021, from <https://www.britannica.com/place/Europe/images-videos#/media/1/195686/228157>.
- Encyclopedia Britannica Inc. Vegetation Zones – Europe. Retrieved January 15, 2021, from <https://www.britannica.com/place/Europe/Plant-life#/media/1/195686/145418>.
- MapsofWorld.Com. (2020, February 21). Europe Latitude Longitude Map. Retrieved January 15, 2021, from [https://www.mapsofworld.com/lat\\_long/europe.html](https://www.mapsofworld.com/lat_long/europe.html).

### ✓ SUMMATIVE PERFORMANCE TASK

#### *What do climate patterns across Germany and its neighbors reveal about natural environments in those regions?*

Construct an argument (e.g., detailed outline, poster, essay) that addresses the compelling question, using specific claims and relevant evidence from contemporary sources while acknowledging competing views.

### ⊕ EXTENSION (OPTIONAL) TASK

Expand on the Map Challenge or increase the rigor by adding scenario-type questions that incorporate comparisons of climate with physical land features into the questions. Consider adding scenario-type questions to the Map Challenge that mimic those found in the **Formative Performance Task 3**.

### ★ TAKING INFORMED ACTION

**Understand:** Learning about the environmental factors of a region is vital to learning how people live in that region.

**Assess:** Explore environmental features—climate, vegetation, crops—in your state.

**Act:** Create a display (e.g., a map) that illustrates the impact of climate and vegetation on how people live in your state.

### CONCEPTS LIST

- Climate
- Subclimate
- Vegetation and plant life
- Human environment interaction and adaptation
- Borders
- Political boundaries
- Longitude
- Latitude
- Region
- Temperate
- Oceanic
- Continental
- Alpine
- Biodiversity
- Deciduous
- Subarctic
- Polar tundra
- Highland
- Subtropical
- Tundra
- Boreal forest
- Steppe
- Peninsula
- Shrubland