Climate Shapes Life

Trace how temperature and rainfall shape vegetation and biodiversity.

WG.3.3 "Describe the world patterns of natural vegetation and biodiversity and their relations to world climate patterns."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline clues about temperature or rainfall, circle types of vegetation, draw arrows connecting at least three climate clues to vegetation they help explain, and star two statements about biodiversity.

From Rain Forest to Tundra

1. Imagine traveling from the equator toward the Arctic. Near the equator, strong sunlight and frequent rain support tropical rain forests in parts of the Amazon and Congo basins. Trees grow in layers, creating many habitats for insects, birds, and other organisms. This variety helps explain why tropical rain forests have exceptionally high biodiversity. Farther from the equator, seasonal shifts in rainfall become more important. In parts of East Africa, savannas have grasses and scattered trees because a long dry season limits dense forest growth. Climate shapes both the plants that can survive and the animals they shelter.

2. Dryness can matter more than heat. The Sahara is hot and receives very little rain, so vegetation is sparse and plants must conserve water. Cold deserts also exist: Antarctica receives little precipitation, and extreme cold sharply limits plant growth. By contrast, midlatitude regions with moderate rainfall and distinct seasons often support temperate forests. Broadleaf trees in much of eastern North America shed leaves before winter, when cold temperatures limit growth. Where rainfall is too low to support many trees but enough for grasses, temperate grasslands spread across places such as the North American Great Plains. Biodiversity generally changes with water, warmth, and habitat variety.

3. Near the poles, low temperatures and short growing seasons favor tundra, with mosses, grasses, and low shrubs rather than tall trees. Between many tundra areas and temperate forests lies a broad belt of boreal forest, dominated by cold-tolerant conifers. Climate patterns do not form perfect stripes. Ocean currents, elevation, and mountain barriers can change local temperature or rainfall. For example, the Andes block some moist air arriving from the east, helping create the dry Atacama Desert west of the mountains. A place's vegetation and biodiversity depend on its specific combination of heat, moisture, and growing season, not latitude alone.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why do tropical rain forests in the Amazon and Congo basins have different vegetation from savannas in parts of East Africa? Include a link to biodiversity.

2. The Sahara and Antarctica are both deserts. How do precipitation and temperature limit plant growth in each place?

3. How does rainfall help explain the difference between vegetation in eastern North America and the Great Plains?

4. How does the Atacama Desert show that latitude alone cannot predict natural vegetation?

3 YOUR TURN

Your own words

A temperate grassland has hotter summers and less rainfall for 30 years, while its winters stay cool. In four or five sentences, predict changes to its natural vegetation and biodiversity, explain the climate links, and name one other factor that could affect your prediction.

Climate Shapes Life

PART 1 · READ AND MARK

Underline clues about temperature or rainfall, circle types of vegetation, draw arrows connecting at least three climate clues to vegetation they help explain, and star two statements about biodiversity. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why do tropical rain forests in the Amazon and Congo basins have different vegetation from savannas in parts of East Africa? Include a link to biodiversity.	**Frequent rain supports layered rain forests with many habitats and exceptionally high biodiversity. East Africa's long dry season limits dense forest growth, favoring grasses and scattered trees.**
2	The Sahara and Antarctica are both deserts. How do precipitation and temperature limit plant growth in each place?	**Both receive little precipitation. The hot Sahara has sparse vegetation whose plants must conserve water, while Antarctica's extreme cold also sharply limits plant growth.**
3	How does rainfall help explain the difference between vegetation in eastern North America and the Great Plains?	**Moderate rainfall supports temperate forests in much of eastern North America. The Great Plains receive too little rain for many trees but enough for grasses.**
4	How does the Atacama Desert show that latitude alone cannot predict natural vegetation?	**The Andes block some moist air arriving from the east, contributing to the Atacama's dry climate. This local barrier affects vegetation regardless of latitude.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

With hotter summers and less rain, the grassland may become patchier, with drought-tolerant grasses and shrubs replacing plants that need more water. Animals that rely on thick grass cover may decline as their habitat shrinks. Species adapted to dry conditions may become more common, so biodiversity could change rather than simply fall everywhere. Soil conditions could affect which drought-tolerant plants establish.

Accept other plausible vegetation and biodiversity changes if students link them to hotter, drier conditions. The additional factor should reasonably affect the outcome, such as soil, grazing, or fire.