Climate to Canopy

Use a northward climate model to locate and explain biomes.

HS-ENV1-6 "Use a model to locate and describe the major Earth biomes. Analyze data to assess how biomes are determined by climate (temperature and precipitation patterns) that support specific kinds of plants."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each climate clue in the passage, and circle the plants it helps explain. Number the biomes in the order you would encounter them while traveling north in the model.

A Journey Through Climate Zones

1. Imagine traveling north from the equator with a thermometer and rain gauge. A biome is a broad region shaped largely by long-term temperature and precipitation patterns. The table models five stations at different latitudes and settings, not every place at those latitudes. Use both climate measures and seasonal notes to infer which plants can survive.

CLIMATE MODEL: FIVE NORTHWARD STATIONS

Station and location	Mean annual temperature	Annual precipitation	Seasonal pattern
A: 0°, equatorial lowland	26°C	2,400 mm	Rain all year
B: 25° N, western interior	24°C	110 mm	Dry most months
C: 42° N, continental interior	10°C	650 mm	Rain peaks in spring and summer
D: 48° N, coast	10°C	1,100 mm	Rain all year
E: 68° N, Arctic land	−9°C	250 mm	Brief, cool summer

2. Near the equator, steady warmth and frequent rain support layered tropical rain forests. Around 25° north or south, dry belts often support deserts with widely spaced, water-storing plants. In midlatitude continental interiors, moderate rain concentrated in the growing season can support grasslands; seasonal drought and fires limit tree cover.

3. Midlatitude coasts with reliable rainfall can support temperate forests, including broadleaf and conifer trees. Farther toward the poles, boreal forests contain cold-tolerant conifers where summers are short but long enough for trees. On Arctic land, tundra has a shorter growing season; mosses and low shrubs dominate. Low annual precipitation occurs in both deserts and tundra, but their temperatures differ.

2 ANSWER WITH EVIDENCE

Use the passage

1. Stations A and D both receive rain all year. Identify each biome, then use temperature and the passage to explain how their plants differ.

2. Stations B and E receive little precipitation. Why would their biomes have different kinds of plants? Use both temperature values.

3. Stations C and D have the same mean annual temperature. Which is more likely to support grassland, and which is more likely to support forest? Explain using their precipitation data.

4. Follow the stations northward from A to E. Name the biome each station represents, in order, and give one reason the model cannot show every biome.

3 YOUR TURN

Your own words

Add a sixth station to the northward model: 57° N, continental interior, mean annual temperature 1°C, and 550 mm of precipitation, mostly in summer. Place it relative to stations D and E, predict its biome and dominant plants, and use two climate clues to defend your prediction.

Climate to Canopy

PART 1 · READ AND MARK

Underline each climate clue in the passage, and circle the plants it helps explain. Number the biomes in the order you would encounter them while traveling north in the model. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Stations A and D both receive rain all year. Identify each biome, then use temperature and the passage to explain how their plants differ.	**A is tropical rain forest: its 26°C mean and year-round rain support layered forest. D is temperate forest: its cooler 10°C mean and reliable rain support broadleaf and conifer trees.**
2	Stations B and E receive little precipitation. Why would their biomes have different kinds of plants? Use both temperature values.	**B is a warm desert at 24°C, with widely spaced, water-storing plants. E is cold tundra at −9°C, where a short growing season favors mosses and low shrubs.**
3	Stations C and D have the same mean annual temperature. Which is more likely to support grassland, and which is more likely to support forest? Explain using their precipitation data.	**C is more likely to support grassland because it receives 650 mm, with rain concentrated in spring and summer. D is more likely to support temperate forest because it receives 1,100 mm spread throughout the year.**
4	Follow the stations northward from A to E. Name the biome each station represents, in order, and give one reason the model cannot show every biome.	**A: tropical rain forest; B: desert; C: temperate grassland; D: temperate forest; E: tundra. The five stations omit climates such as those that support boreal forest.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would place the new station between D and E because 57° N lies between 48° N and 68° N. I predict boreal forest with cold-tolerant conifers. Its 1°C mean is warmer than E's −9°C, and its 550 mm of precipitation, mostly in summer, can support trees during a short growing season.

Accept biome labels supported by the station data and passage. For the new station, look for placement between D and E and a boreal-forest prediction supported by both temperature and precipitation.