# Rain, Grass, Fire

How climate and living things shape two tropical biomes

**ENV.1.1** "Identify, investigate, and evaluate the interactions of the abiotic and biotic factors that determine the types of organisms that live in major biomes."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline one abiotic condition in each biome, circle two organisms that affect other organisms, and write 1 and 2 beside two sentences that link these factors to which organisms can live there.

### Why Forests and Grasslands Grow

1 Near the equator, a tropical rainforest stays warm and receives rain in most months. Tall trees form a dense canopy that intercepts sunlight, so few grasses grow on the shaded forest floor. Vines climb trunks to reach brighter light, while insects and birds feed among the leaves. Frequent rain washes some nutrients deep into the soil, but fungi break down fallen leaves and release nutrients near the surface. Many trees have shallow roots that absorb those nutrients quickly. Warmth and water allow dense growth, yet shade and nutrient loss limit which plants can thrive beneath the canopy.

2 A tropical savanna is also warm, but much of its rain falls in one season. During the long dry season, grasses may turn brown while their roots stay alive underground. When rain returns, many grasses grow again. Scattered trees survive with roots that reach deep water or bark that protects living tissue during some fires. Grazing animals eat grasses, and predators hunt those grazers. Fire often spreads through dry grass and can kill young trees before they grow thick bark. Thus seasonal water shortage and fires help keep open grassland where grazers can find food.

3 These biomes are not separated by temperature alone. In a rainforest, a closed tree canopy keeps the ground shady and damp, making it harder for sun-loving grasses to spread and carry fire. In a savanna, grasses provide fuel for fires, and repeated fires prevent many young trees from forming a closed canopy. Heavy grazing can reduce grass fuel in some places, so fire effects vary across the landscape. Rainfall patterns set important limits, but plants and animals can change light, fuel, and access to food. To judge where an organism can live, consider both climate and these living interactions.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. How do rainfall and fungi together affect where rainforest trees obtain nutrients?

2. How do the dry season and fire combine to favor grasses over young trees in a savanna?

3. How does a rainforest tree canopy change an abiotic factor, and why does this limit grasses?

4. If grazers eat much of the grass in one part of a savanna, how could that change fire's effect on young trees there?

## 3 YOUR TURN

Your own words

Imagine a rainforest begins having a long dry season each year, but fires remain rare. In four sentences, predict changes in plants and animals, explain how an abiotic condition and a biotic interaction shape your prediction, and name one reason the outcome is uncertain.

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## PART 1 · READ AND MARK

Underline one abiotic condition in each biome, circle two organisms that affect other organisms, and write 1 and 2 beside two sentences that link these factors to which organisms can live there. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | How do rainfall and fungi together affect where rainforest trees obtain nutrients? | **Rain washes some nutrients deep into the soil, while fungi release nutrients near the surface. Shallow tree roots absorb the nutrients released near the surface.** |
| 2 | How do the dry season and fire combine to favor grasses over young trees in a savanna? | **Grass roots survive the dry season and grow again when rain returns. Fires spread through dry grass and can kill young trees.** |
| 3 | How does a rainforest tree canopy change an abiotic factor, and why does this limit grasses? | **The canopy blocks sunlight, leaving less light on the forest floor for grasses.** |
| 4 | If grazers eat much of the grass in one part of a savanna, how could that change fire's effect on young trees there? | **Less grass means less fuel for fire, so fewer young trees might be killed by fire in that area.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

A long dry season could reduce dense tree growth because less water may be available near the soil surface. If the canopy opens, more sunlight could reach the ground and allow more grasses to grow. Those grasses could provide food for more grazing animals, although surviving trees might still shade some patches. The outcome is uncertain because the passage does not say how much rain would fall during the wet season.

Accept other supported predictions that connect water or light to a plant change and a biotic interaction to an animal or plant change. Predictions should be conditional because the amount of rainfall and the extent of canopy change are unknown.