

LESSON 3: RAINFORESTS AND CLIMATE STABILITY

Lesson plan overview

In this lesson, students explore how rainforests play a critical role in regulating the Earth's climate through the carbon and water cycles. Through engaging videos and diagrams, students learn how forests act as carbon sinks, how transpiration helps fuel global rainfall patterns, and what happens to Earth's temperature and weather systems when rainforests are lost. A hands-on labeling activity reinforces scientific concepts, while a graph-based math extension helps students visualize the climate impact of different tree species. By the end of the lesson, students will be able to explain how protecting tropical forests supports climate stability around the world—and why rainforest conservation is a powerful climate solution.

Educational materials

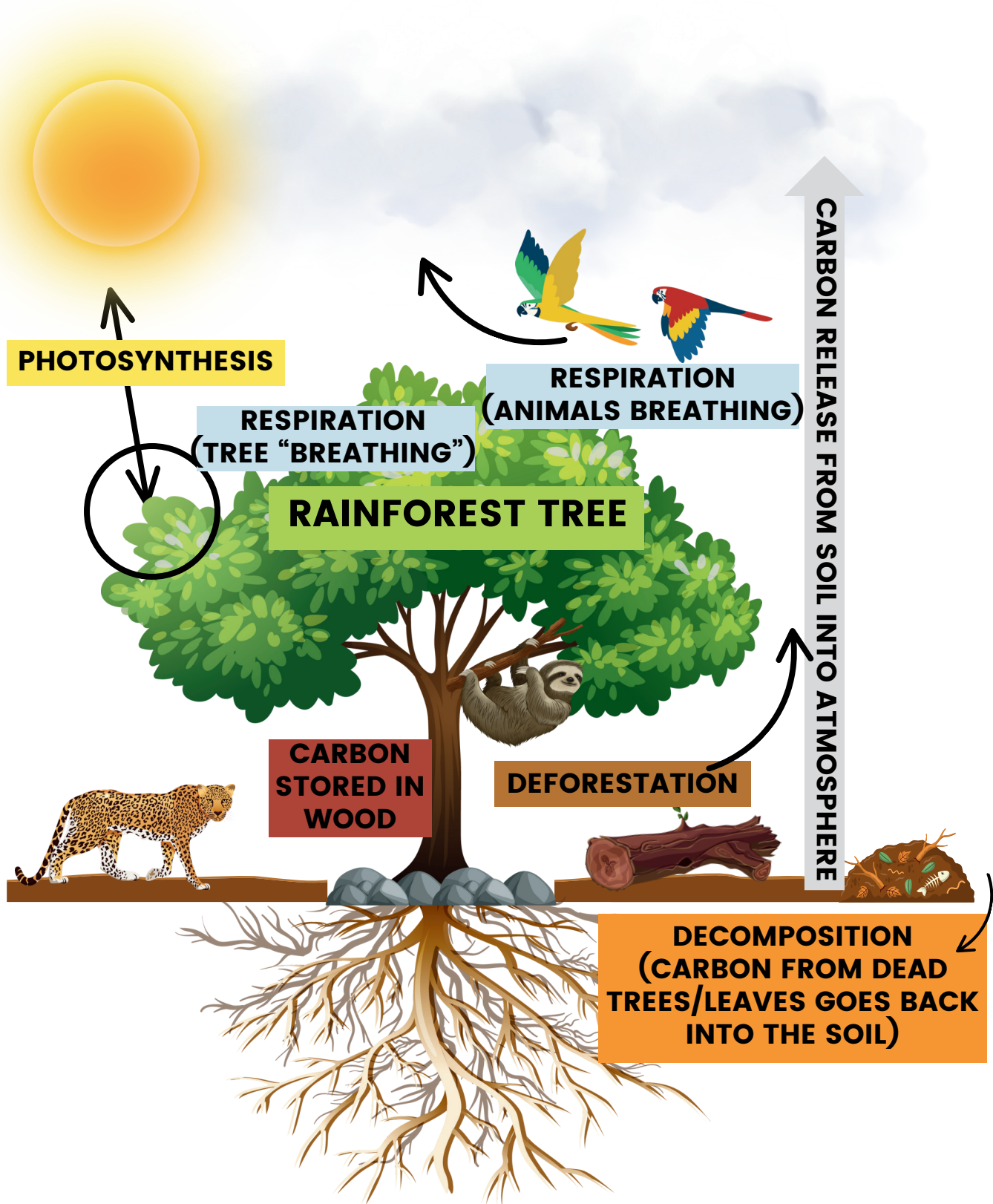
- **Videos:** 'How Rainforests Regulate the Climate'; 'The Carbon Cycle and Rainforests'; 'The Water Cycle and Rainforests'
- **Worksheet:** Carbon cycle and water cycle diagrams
- **Quiz:** Multiple-choice on carbon sink, transpiration, climate feedback loops
- **Math tie-in:** Carbon storage bar graph activity
- **Art tie-in:** Layers of the rainforest flap poster
- **Classroom discussion questions:**
 - What role do rainforests play in keeping the Earth cool?
 - How do forests make their own rain?

WORKSHEET: Carbon Cycle Diagram



Name: _____

Date: _____



WORKSHEET: Carbon Cycle Diagram



Name: _____ Date: _____

Word bank:

Photosynthesis Respiration Decomposition / Soil carbon
Deforestation Carbon storage Atmosphere

_____ = CO₂ gas in the air

_____ = plants turn CO₂ into oxygen and sugar

_____ = living things release CO₂

_____ = carbon in tree trunks and roots

_____ = carbon in soil from dead plants

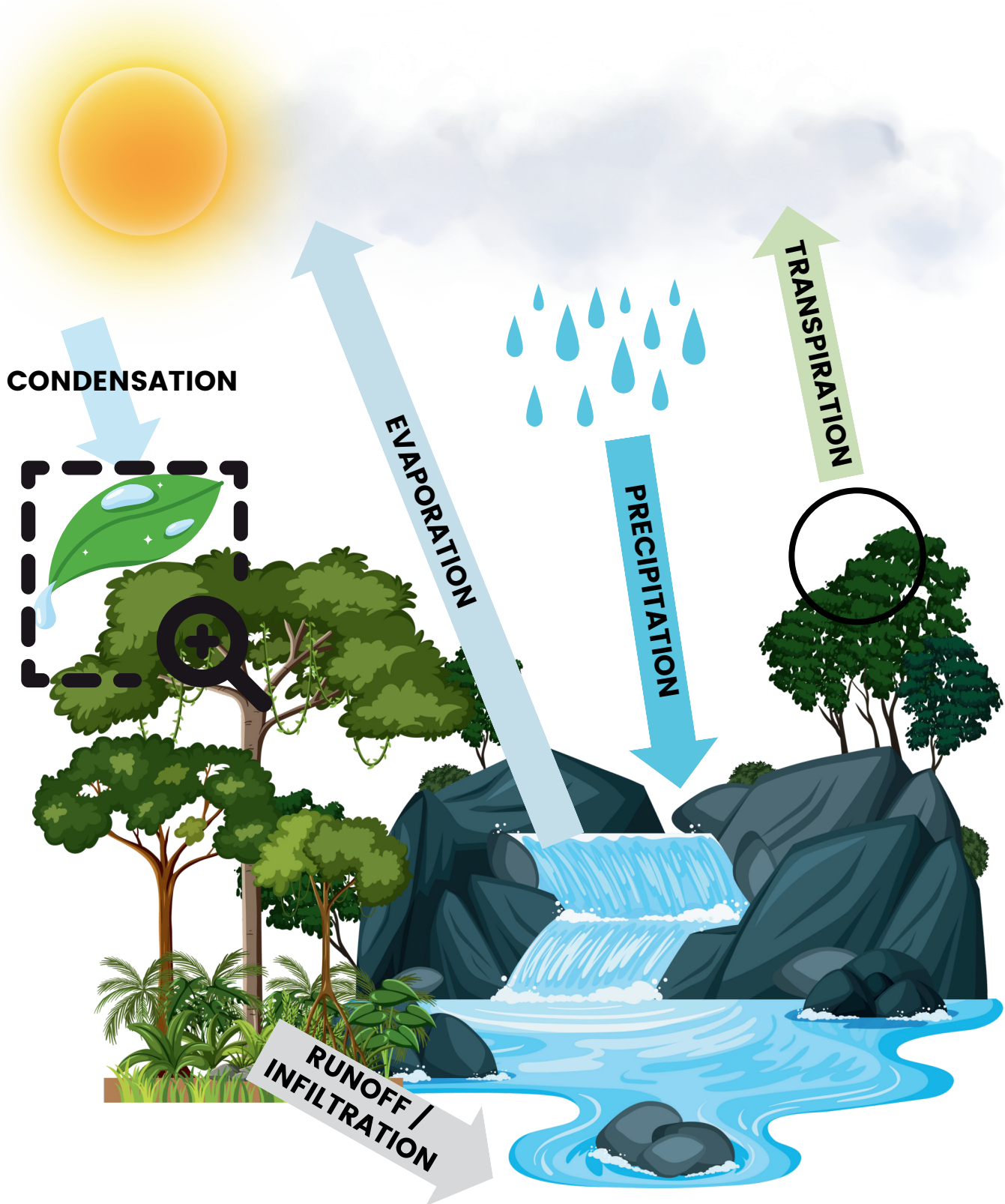
_____ = rotting trees and plants release CO₂

WORKSHEET: Water Cycle Diagram



Name: _____

Date: _____



WORKSHEET: Water Cycle Diagram



Name: _____ Date: _____

Word bank:

Evaporation Transpiration Precipitation
Runoff / Infiltration Condensation

_____ = water vapor from rivers, lakes, or soil

_____ = water vapor released from plant leaves

_____ = water vapor turns into clouds

_____ = rain falls back to Earth

_____ = water moves into rivers or underground

WORKSHEET: TEACHER ANSWER KEY



Answer Key: Carbon Cycle Diagram

Labels:

Atmosphere (CO₂)—Carbon dioxide gas in the air

Photosynthesis—Trees absorb CO₂ from the air and store carbon as they grow

Respiration—Plants and animals release CO₂ back into the atmosphere

Carbon Storage—Carbon locked inside tree trunks, branches, roots, and leaves

Soil Carbon / Decomposition—Carbon from fallen leaves and dead plants is broken down into the soil

Deforestation / Fire—Cutting or burning trees releases carbon back into the atmosphere as CO₂

Answer Key: Water Cycle Diagram

Labels:

Evaporation—Liquid water from rivers, soil, or forest floor changes into water vapor

Transpiration—Water vapor released from rainforest tree leaves

Condensation—Water vapor cools and forms clouds

Precipitation—Water falls back to Earth as rain

Runoff / Infiltration—Rainwater flows over the land into rivers or soaks into the soil and groundwater

QUIZ: Carbon and Water Cycles



Name: _____ Date: _____

Multiple choice

Circle the best answer (1 point each)

What is a carbon sink?

- a) A machine that removes carbon from the air
- b) Something that stores more carbon than it releases
- c) A type of rainforest tree
- d) A pipe that leads carbon into the soil

Which process describes trees releasing water vapor into the air?

- a) Evaporation
- b) Condensation
- c) Transpiration
- d) Precipitation

What happens to carbon when rainforests are cut or burned down?

- a) It disappears from the planet
- b) It stays safely in the soil
- c) It is released back into the atmosphere
- d) It turns into water vapor

Rainforests help cool the Earth mainly by:

- a) Blocking sunlight completely
- b) Releasing oxygen at night
- c) Creating clouds that reflect sunlight and absorb CO₂
- d) Making wind blow faster

Which of the following could be a result of losing large areas of rainforest?

- a) More frequent rainfall in nearby areas
- b) More carbon stored in trees
- c) Hotter and drier climates over time
- d) Increased biodiversity

QUIZ: Carbon and Water Cycles

ANSWER KEY



- b) Something that stores more carbon than it releases
- c) Transpiration
- c) It is released back into the atmosphere
- c) Creating clouds that reflect sunlight and absorb CO₂
- c) Hotter and drier climates over time

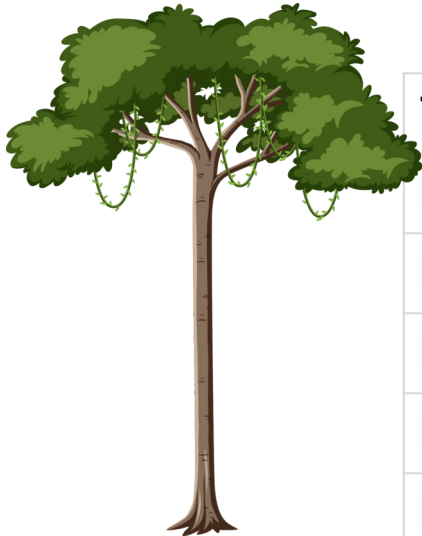
MATH TIE-IN



Carbon Storage Bar Graph Activity

Use the table below showing how much carbon different rainforest tree species can store (in tons of CO₂ per tree).

Create a bar graph comparing carbon storage between tree species.



Note: Numbers are fictional for education purposes.

Tree species	Tons of CO ₂ stored (per tree)
Kapok tree	8 tons
Brazil nut tree	6 tons
Mahogany	5 tons
Rubber tree	3 tons
Banana plant	1 ton

A grey, stylized cloud shape containing the text "CO₂" in large, bold, black letters.

CO₂

Questions:

Which tree stores the most carbon?

How much more carbon does a kapok tree store than a rubber tree?

If you planted 10 kapok trees, how many tons of CO₂ could they store altogether?

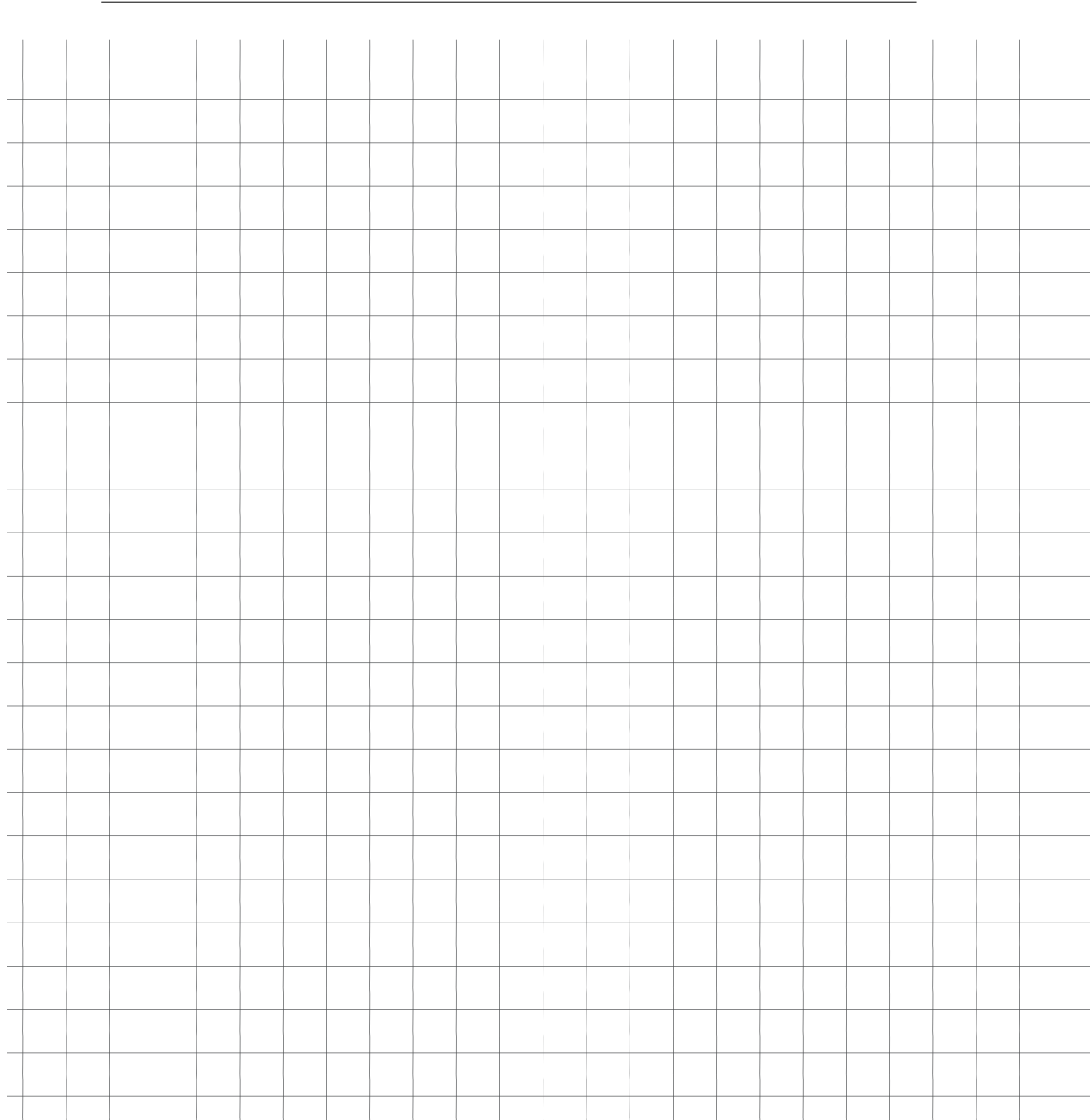
Based on your graph, which trees would be best to protect for fighting climate change? Why?

MATH TIE-IN



Carbon Storage Bar Graph Activity

Amount of carbon dioxide (tons)



Kapok tree

Brazil nut tree

Mahogany

Rubber tree

Banana plant

ART TIE-IN



Rainforest Layers Flap Poster

Prompt for students:

"Design a creative poster showing how rainforests help cool our planet—like a giant air conditioner or a pair of Earth's lungs! Use pictures and words to help teach others why keeping rainforests standing matters for the carbon and water cycles."

Poster must include:

- A catchy title (examples: "Keep Earth Cool!" or "Rainforests = Climate Heroes")
- At least one fact about the carbon cycle
- At least one fact about the water cycle
- A rainforest themed illustration (trees, clouds, animals, etc.)
- A simple message about what people can do to help protect forests

INSPIRATION

