

Where Tree Matter Begins

Tracing evidence for the materials that build plants.

5-LS1-1 "Support an argument that plants get the materials they need for growth chiefly from air and water. Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline two pieces of evidence that support the idea that most new plant matter comes from air and water. Circle words that name a material and its source.

What Builds a Growing Plant?

- ① Imagine a tiny maple seed growing into a young tree. The tree becomes far heavier than the seed, yet it does not pull most of that new matter from the ground. Its roots take in water and small amounts of minerals from soil. Its leaves take in carbon dioxide, a gas in the air, through tiny openings called stomata.
- ② Inside green leaves, sunlight provides energy for a process that makes sugars. The plant combines carbon dioxide from air with water from its roots. Sugars can be used for energy or joined to make new plant parts, such as wood, stems, roots, and leaves. This is why the carbon in much of a plant's dry mass came from carbon dioxide, not soil.
- ③ Scientists have tested this idea by growing a plant in a pot while measuring the soil. Before planting, they dried and weighed the soil. After the plant grew, the plant's mass had increased greatly, but the soil had lost only a small amount of mass. The evidence shows that soil minerals matter, but they cannot account for most of the plant's new matter.

2 ANSWER WITH EVIDENCE Use the passage

1 What material do leaves take in from the air, and what materials do roots take in from the soil?

2 How do carbon dioxide and water help a plant make new parts?

3 What happened to the plant's mass and the soil's mass in the scientist's test?

4 How does the soil test support the claim that plants get most of their growth materials from air and water?

3 YOUR TURN Your own words

Write a two-sentence argument explaining where most of a plant's new matter comes from. State your claim in the first sentence, then use two details from the passage as evidence in the second sentence.

PART 1 • READ AND MARK

Underline two pieces of evidence that support the idea that most new plant matter comes from air and water. Circle words that name a material and its source. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What material do leaves take in from the air, and what materials do roots take in from the soil?	Leaves take in carbon dioxide from air. Roots take in water and small amounts of minerals from soil.
2	How do carbon dioxide and water help a plant make new parts?	With energy from sunlight, the plant combines carbon dioxide and water to make sugars, which can be joined to make new plant parts.
3	What happened to the plant's mass and the soil's mass in the scientist's test?	The plant's mass increased greatly, while the soil lost only a small amount of mass.
4	How does the soil test support the claim that plants get most of their growth materials from air and water?	Because the plant gained much more mass than the soil lost, soil could not have supplied most of the new plant matter.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Plants get most of the material for growth from air and water, not soil. Leaves take in carbon dioxide and roots take in water, and a growing plant gains much more mass than the small mass lost by its soil.

Accept arguments that state that plant matter chiefly comes from air and water and that distinguish the small amount of soil minerals from most new plant matter. Evidence may include carbon dioxide entering leaves, water entering roots, sugar production, or the soil-mass investigation.