Name & Surname: _____ Class: _____ Date: _____

Air and Water Builders

How plants grow big without eating soil

About 40 minutes Level ★★★☆☆

Plants Make Their Food

Green plants make their own food, a sugar, in photosynthesis. They take in **water** through roots and carbon dioxide gas from **air** through tiny leaf pores.



- Sunlight gives energy for photosynthesis, and oxygen is let out.
- Most new plant weight comes from air and water, not soil.
- Dry soil weighs almost the same after a plant grows tall.
- Soil gives only small amounts of minerals like nitrogen, phosphorus, and potassium.

Key Words

photosynthesis: how plants use sunlight, water, and air to make sugar

carbon dioxide: a gas in air that plants take in

stomata: tiny pores in leaves that let gases in and out

mineral: a soil nutrient plants need in small amounts

oxygen: a gas plants release and people breathe

sugar: the food plants make for energy and growth

Task A

/3

Circle the odd one out in each row and tell why.

1. air | soil | water | carbon dioxide

   Why?

2. water | carbon dioxide | minerals | sugar

   Why?

3. potassium | phosphorus | nitrogen | carbon

   Why?

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Dear Young Scientist

Write a short letter to explain plant food to someone younger.

Task B

Write a short letter that uses evidence to explain where plants grow from.

Date: _____

Dear Friend,

Say what plants need to make food: sunlight, water from roots, and carbon dioxide from air

Give two reasons plants grow mostly from air and water, not soil

Tell about one test with weighing soil before and after growing

Your friend, _____

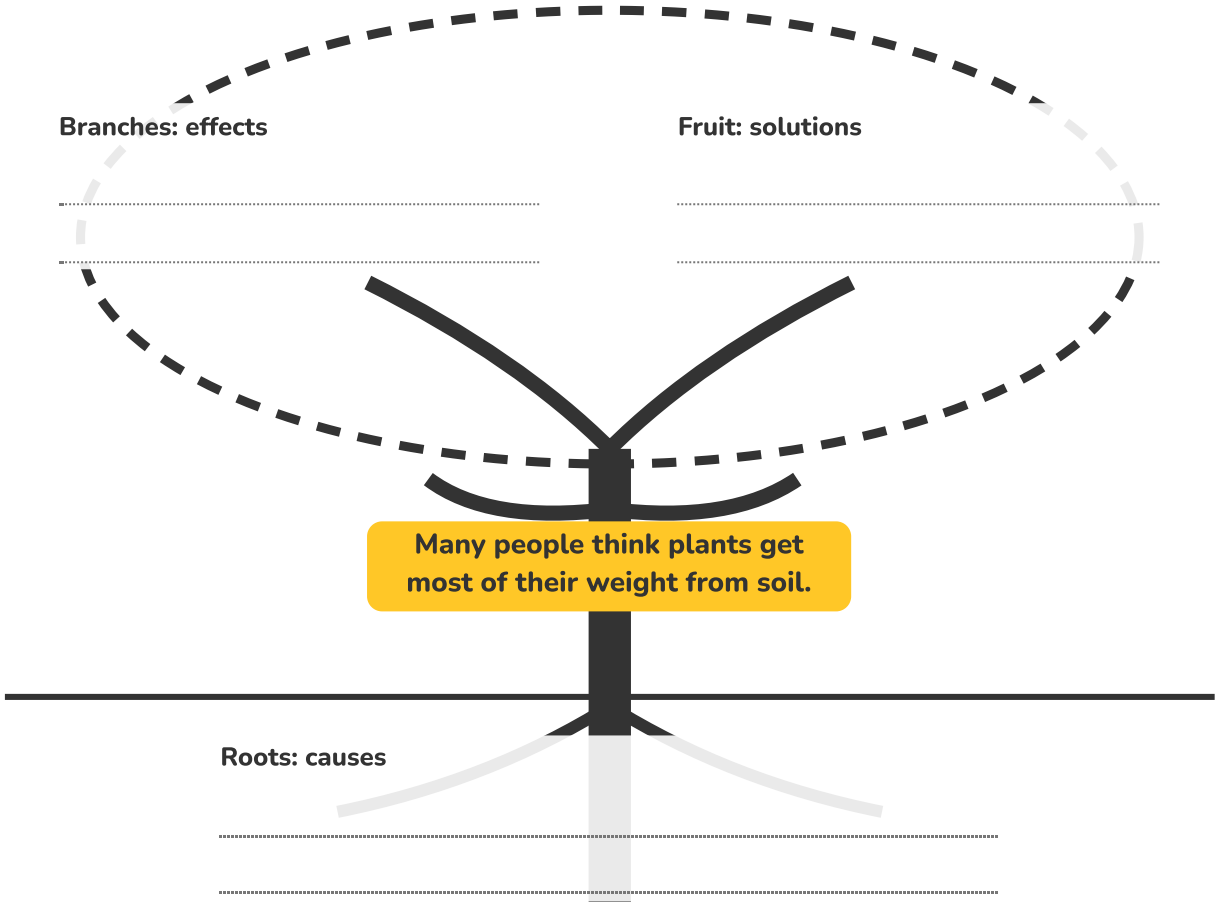
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Why Think Soil?

Map why people think soil feeds plants and what is true.

Task C

Fill the tree roots and branches with causes and effects about the soil idea.



Test the Soil

Use experiment clues to figure out where weight comes from.

Task D

/2

Read the test and grow your idea with clues.

A student filled a pot with dry **soil** and weighed it. The student planted a seed and added only **water** for many weeks. The plant grew tall and heavy. The dry soil weighed almost the same as before.

Question	It says...	I say...	And so...
Where did the plant's extra **weight** come from?	The soil weighed almost the same after growth.	The weight did not come from soil.	It came chiefly from air and water.
What does this tell about **soil** as food?			

Task E

/5

Tick fact or opinion for each. Then explain one choice with what can be checked.

Statement	Fact	Opinion
Plants take in carbon dioxide through tiny leaf pores called stomata.		
Most plant growth material comes from air and water.		
Learning how plants grow from air is the most fun topic ever.		
Every student should think soil tests are boring.		

How can you tell that one of them is an opinion?

.....

.....

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Explain with Evidence

Answer clearly and show causes and effects of missing needs.

Task F

/3

Answer in short sentences using evidence from page 1.

1. What do plants take from **air** to grow?
   Plants take...
2. Why is soil not the main source of plant **weight**?
   I know because...
3. What is plant **food** and how is it made?
   Plant food is...

Task 6

Think what happens when needs are missing.

Causes

- No water taken up by roots
-
-
-

→ **A plant gets rich soil but no water and little fresh air** →

Effects

- Makes little sugar for energy and growth
-
-
-

How did I do?

Circle a face for each line.

I can explain that plants get most growth materials from air and water.	☹	😐	☺
I can use evidence to show soil is not the main source of weight.	☹	😐	☺
I can describe how photosynthesis makes plant food.	☹	😐	☺

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Answer sheet: Air and Water Builders

Task A

1. soil (Plants build most weight from air and water; soil gives only tiny minerals.)
2. sugar (Sugar is true food with energy; the others have no food energy.)
3. carbon (Carbon comes from air; the other three are minerals from soil.)

Task B

Answers will vary.

Task C

Answers will vary, e.g. causes: People see roots in soil and see fertilizer help plants grow; effects: Plants without enough water or air grow poorly even in rich soil; solutions: Weigh soil before and after growth to show it hardly changes

Task D

1. It came chiefly from air and water.
2. Soil gives only tiny minerals, not most growth material.

Task E

1. Fact
2. Fact
3. Opinion
4. Opinion

Task F

1. Carbon dioxide gas through stomata in leaves.
2. Soil loses almost no weight as plants grow, so most matter must come from air and water.
3. Sugar made in photosynthesis using water, carbon dioxide, and sunlight energy.

Task G

Causes: No water taken up by roots; No carbon dioxide taken in through leaves; Cannot do enough photosynthesis

Effects: Makes little sugar for energy and growth; Stays small and gains little weight; Leaves droop and growth slows

Pictures: Microsoft Fluent Emoji (MIT)

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