Name _____ Date _____

What Plants Need to Grow: Is a Bean Plant Made of Soil?

Directions: Read about the bean plant experiment and look at the table. Then answer each question.

Weighing the Soil

Theo's class wondered whether plants are made of soil. They filled three pots with oven-dried soil and weighed the soil in each pot. Then they planted one bean seed, weighing less than 1 gram, in each pot. For eight weeks, the pots sat in a sunny window and got water. Then the class pulled out each plant, shook its soil back into the pot, and weighed the plant. Last, they dried and weighed the soil again. Their scale measured to the nearest gram.

A bean plant needs light, water, air, and small amounts of minerals. It uses light energy to make its own food from water and carbon dioxide, a gas in the air. Its body is built mostly from that water and gas. Soil holds water for the roots and gives the plant small amounts of minerals, but soil is not the plant's food.

Oven-dried soil and bean plants in three pots, weighed at the start and after 8 weeks

Pot	Dry soil at start (g)	Dry soil after 8 weeks (g)	Bean plant after 8 weeks (g)
A	1,500	1,499	42
B	1,500	1,500	37
C	1,500	1,499	48

1. According to the table, which pot had the heaviest bean plant after 8 weeks?

A. All three plants weighed the same.
B. Pot A
C. Pot B
D. Pot C

2. How much did the dry soil in Pot A change during the 8 weeks?

A. It gained 1 gram.
B. It lost 42 grams.
C. It lost 1 gram.
D. It did not change at all.

3. Which claim do the class's measurements support?

A. Every bean plant grows to about 40 grams in 8 weeks.
B. Most of each bean plant's mass did not come from the soil.
C. The plants grew because the window was warm.
D. The plants took nothing at all from the soil.
E. Most of each bean plant's mass came from the soil.

4. Use the word bank to finish the sentences about what Theo's bean plants needed.

Word bank
food • light • minerals • soil

Each bean plant used energy from _____ to make its own food. Its roots took in water and small amounts of _____ from the soil.

5. The plants gained far more mass than their soil lost. According to the passage, what was most of that new plant mass built from?

A. Soil

B. Water and carbon dioxide from the air

C. Sunlight

D. Minerals

6. Pot B's soil weighed 1,500 grams at the start and at the end. Does that show the Pot B plant took nothing at all from the soil?

A. No. It shows that all of the plant's mass came from the soil.

B. No. The plant may have taken an amount of minerals too small for the class's scale to show.

C. Yes. The Pot B plant did not need water.

D. Yes. It proves the plant took nothing at all from the soil.

7. Why did the class dry the soil before weighing it at the start and at the end?

A. Because dry soil is the plant's food

B. So the soil would weigh more

C. So the bean seeds would sprout faster

D. So water in the soil would not change the soil's mass

8. What would happen if Theo grew a bean plant in a sunny window with its roots in water that had a few minerals mixed in, and no soil at all?

A. It would grow only in the dark, because the water would feed it.

B. It could not grow at all, because plants make their food from soil.

C. It would have to turn the water into soil before it could grow.

D. It could still grow, because it would have light, water, air, and minerals.