Name: Class Period:

Pre-test: In the box, place a check (✓) if you are sure about your answer. Place a tilde (~) if you guessed. Place a question mark (?) if you do not have enough knowledge to guess. Please be honest.

_A._ [~] *Example: ____ refers to the ability of soil to transmit water throughout its depth.*

a. Percolation

b. Active transport

_____ [ ] 1. Plants require ___ different elements to be healthy.
a. 2
b. 17

_____ [ ] 2. Plants and humans require ____ essential elements.
a. similar
b. different

_____ [ ] 3. Plants obtain their essential elements from ____.
a. air, water, and soil.
b. air, water, and pollen.
c. air, pollen, and soil.

_____ [ ] 4. Soil _____.
a. serves as a nutrient bank for plants.
b. contain both organic and inorganic material.
c. differ in their abilities to hold and transmit water.
d. All of the above.
e. None of the above.

_____ [ ] 5. Plants transport water from the roots through _____and food from the leaves through _____ .
a. the xylem; the phloem.
b. the phloem; photosynthesis.
c. diffusion; photosynthesis.

_____ [ ] 6. Plants require nutrients to be present in certain amounts to be healthy. The essential components of most fertilizers are _____.
a. Nitrogen, Zinc, Boron.
b. Nitrogen, Iron, Manganese.
c. Nitrogen, Phosphorus, Potassium.

_____ ☐ 7. _____ is a process used by cells to move molecules from an area of lower concentration to one of higher concentration.
   a. Osmosis
   b. Active transport
   c. Inertia
   d. Diffusion

_____ ☐ 8. Nutrients enter root cells through the process of _____.
   a. diffusion
   b. osmosis

_____ ☐ 9. Plant roots grow_____.
   a. where water is already present.
   b. until they find water .

_____ ☐ 10. Plants primarily use ____ to absorb water.
   a. filaments
   b. root hairs
   c. the anther

_____ ☐ 11. Plants primarily extract nutrients from the ____.
   a. soil.
   b. atmosphere.

_____ ☐ 12. Approximately _____ of land in the world is devoted to farming.
   a. 83 percent
   b. 11 percent

_____ ☐ 13. Fertilizers help _____ food productivity.
   a. increase
   b. decrease

_____ ☐ 14. Fertilizers can be _____.
   a. Plant-Incorporated-Protectant (PIPS), biochemical, or microbial.
   b. commercial or organic.

_____ ☐ 15. Excessive amounts of nutrients _____.
   a. can pollute water environments.
   b. make plants grow even faster.

A Note to Teachers:

What are pre- and post-tests?

The pre-test and post-test are designed using the learning objectives established for the *Nourishing the Planet in the 21st Century* High School Curriculum. Both tests consist of the same questions. However, the pre-test is given to students before they begin the lessons as a means of measuring how much they already know about the topic. At the conclusion of the lessons, the students take the post-test to measure their ability to apply knowledge or perform a specific task. During the pre-test, some educators choose to have their students circle the correct answer in addition to gauging how comfortable they are with the information in the question. Other educators base their pre-test entirely on how comfortable the students are with the material.

Pre-tests and post-tests help the educator understand the amount of background knowledge the students are bringing to the lesson and how the students' understanding of the content has improved throughout the lessons. Additionally, teachers can compare the results of the two tests and identify areas where students need additional practice or information. Pre-test scores that do not improve during the post-test tell the teacher that the content and delivery methods may need to be modified.

Pre-test Results

Answer Key	✓	~	?	Alignment
*Example A	5	12	13	Lesson X
*Example B	25	3	2	Lesson Y
1 - B				Lesson 1
2 - A				Lesson 1
3 - A				Lesson 1 and 2
4 - D				Lesson 2
5 - A				Lesson 3
6 - C				Lesson 1 and 4
7 - B				Lesson 3
8 - A				Lesson 3
9 - A				Lesson 3
10 - B				Lesson 3
11 - A				Lesson 2 and 4
12 - B				Lesson 5
13 - A				Lesson 4
14 - B				Lesson 4 and 5
15 - A				Lesson 5

*In Example A, the majority of the class was either guessing or did not have enough knowledge on the question to select an answer. Therefore, when pacing lessons and deciding on activities, more time should be spent on a lesson that examines the topics covered in Example A than a lesson for Example B. Finally, decisions on re-teaching materials or using extension activities can be made after comparing the post-test to the pre-test.

Name: Class Period:

Post-test: Write the correct answer on the line. In the box, place a check (✓) if you are sure about your answer. Place a tilde (~) if you guessed. Place a question mark (?) if you do not have enough knowledge to guess. Please be honest.

_A._ ☑ *Example: _____ refers to the ability of soil to transmit water throughout its depth.*

c. Percolation

d. Active transport

_____ ☐ 1. Nutrients enter root cells through the process of _____.
   a. diffusion
   b. osmosis

_____ ☐ 2. Plants require nutrients to be present in certain amounts to be healthy. The essential components of most fertilizers are _____.
   a. Nitrogen, Zinc, Barium.
   b. Nitrogen, Iron, Manganese.
   c. Nitrogen, Phosphorus, Potassium.

_____ ☐ 3. Plants primarily extract nutrients from the ____.
   a. atmosphere.
   b. soil.

_____ ☐ 4. Excessive amounts of nutrients _____.
   a. can pollute water environments.
   b. make plants grow even faster.

_____ ☐ 5. Approximately _____ of land in the world is devoted to farming.
   a. 26 percent
   b. 64 percent
   c. 11 percent

_____ ☐ 6. Plant roots grow_____.
   a. until they find water .
   b. where water is already present.

_____ ☐ 7. Plants primarily use ____ to absorb water.
   a. root hairs
   b. filaments
   c. the anther

_____ ☐ 8. Plants require ___ different elements to be healthy.
   a. 2
   b. 17

_____ ☐ 9. _____ is a process used by cells to move molecules from an area of lower concentration to one of higher concentration.
   a. Osmosis
   b. Inertia
   c. Active transport
   d. Diffusion

_____ ☐ 10. Plants and humans require ____ essential elements.
   a. similar
   b. different

_____ ☐ 11. Fertilizers can be _____.
   a. commercial or organic.
   b. Plant-Incorporated-Protectant (PIPS), biochemical, or microbial.

_____ ☐ 12. Plants obtain their essential elements from ____.
   a. air, water, and pollen.
   b. air, pollen, and soil.
   c. air, water, and soil.

_____ ☐ 13. Soil _____.
   a. serves as a nutrient bank for plants.
   b. contain both organic and inorganic material.
   c. differ in their abilities to hold and transmit water.
   d. All of the above.
   e. None of the above.

_____ ☐ 14. Plants transport water from the roots through _____and food from the leaves through _____ .
   a. the phloem; photosynthesis.
   b. the xylem; the phloem.
   c. diffusion; photosynthesis.

_____ ☐ 15. Fertilizers help _____ food productivity.
   a. increase
   b. decrease

A Note to Teachers:

What are pre- and post-tests?

The pre-test and post-test are designed using the learning objectives established for the *Nourishing the Planet in the 21st Century* High School Curriculum. Both tests consist of the same questions. However, the pre-test is given to students before they begin the lessons as a means of measuring how much they already know about the topic. At the conclusion of the lessons, the students take the post-test to measure their ability to apply knowledge or perform a specific task.

Pre-tests and post-tests help the educator understand the amount of background knowledge the students are bringing to the lesson and understand how the students' understanding of the content has improved throughout the lessons. Additionally, teachers can compare the results of the two tests and identify areas where students need additional practice or information. Pre-test scores that do not improve during the post-test tell the teacher that the content and delivery methods may need to be modified. Most teachers do not grade pre-tests but do grade post-tests.

Post-test Results

Answer Key	✓	~	?	Alignment
*Example A	5	12	13	Lesson X
*Example B	25	3	2	Lesson Y
1 - A				Lesson 3
2 - C				Lesson 1 and 4
3 - B				Lesson 2 and 4
4 - A				Lesson 5
5 - C				Lesson 5
6 - B				Lesson 3
7 - A				Lesson 3
8 - B				Lesson 1
9 - C				Lesson 3
10 -A				Lesson 1
11 -A				Lesson 4 and 5
12 -C				Lesson 1 and 2
13 -D				Lesson 2
14 -B				Lesson 3
15 -A				Lesson 4

*Post-test Results: In post-test Example A, the majority of the class was either guessing or deciding that they did not have enough knowledge on the question to select an answer. In addition, the teacher should examine if the majority of students answered the question correctly. Since the majority of the class was unsure of their answer, the teacher should consider re-visiting the objective/concept with a new activity or different instructional method.
If the majority of students got Example B wrong, but recorded a checkmark, then the concept or topic in the question should be given a good deal of attention in the classroom. It is essential to re-teach the misunderstood concepts with new lessons and activities.