

Name _____ Date _____

Reading

► Read the selection and answer each question.

Super Soil: The Mystery of Terra Preta

- ¹ Since the Amazonian rainforest covers nearly half of the South American continent, you'd think such a large forest must sit on fertile soil. Think again.
- ² The truth is that beneath this dense forest lies possibly the worst soil in the world. Known as "oxisol," this sandy, reddish dirt has a chemical balance harmful to plants, and it is also poor in nutrients. (Nutrients are foods in the soil that plants need to grow.) Year after year, most people who attempt to farm in this region fail; they burn down the forests for their fields, but they only succeed in creating barren farms where nothing grows. That is, unless they find terra preta, or Amazonian dark earth.
- ³ Scattered throughout the jungle, terra preta is a super soil, perhaps the best soil on the planet. Its makeup and its production have captured the curiosity of scientists. And because this soil holds evidence produced by ancient humans, scientists have solved some of the mysteries about the people who lived near the Amazon in ancient times.
- ⁴ In the 1540s, an early Spanish explorer who sailed down the Amazon River to look for gold described seeing large cities with thousands of people. Strangely, these cities were never seen again. There is no trace of lost cities—until you look more closely at terra preta.
- ⁵ The first European settlers who came to live in the Amazon region in Brazil learned about this amazingly fertile soil from the Indians. They called it terra preta de Índio (in Portuguese, "Indian's black earth"). Modern researchers refer to it as TPI. Scientists first learned about TPI in the 1870s. These early researchers believed that Indians had looked for these fertile areas and settled on them—hence the human evidence.
- ⁶ Recent researchers have studied the soil's makeup and found plenty of nutrients. The soil is also packed with organic material, matter related to living things such as decayed plants, animal and human waste, and bones. One surprising fact emerged: TPI contains more charcoal than any other soil on Earth.
- ⁷ Scientists used carbon dating to guess the age of the charcoal, along with the organic remains. The results revealed that TPI is about 2,000 years old, pointing to one conclusion: this super soil was made by humans.

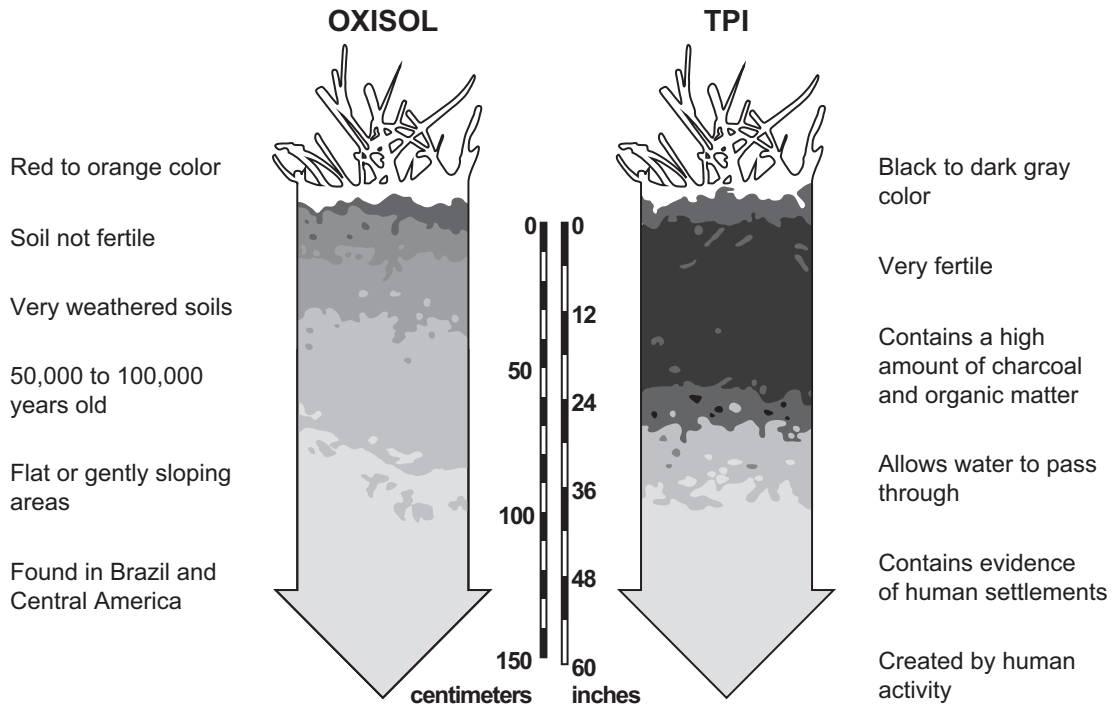
Name _____ Date _____

- ⁸ Picture a village enclosure in the jungle about 2,000 years ago. Houses are built from dried palm leaves. Outside, women cook in clay pots over a fire. Behind each home is a trash pile holding fish bones, fruit, and old roof leaves. Over time, all this organic matter breaks down to create fertile soil, like a huge, prehistoric compost pile.
- ⁹ But what about the charcoal?
- ¹⁰ Scientists have pointed out that the traditional way to dispose of trash in the Amazon is to burn it; this kind of slow, low-temperature burning turns organic matter into charcoal without totally breaking it down.
- ¹¹ If you cut down trees and burn them completely—a process called slash-and-burn—all you'll see left behind is a heap of powdery ashes. You'll also release high amounts of carbon into the air, contributing to global warming. Amazonians, on the other hand, used a method called "slash-and-char"; they didn't burn wood all the way. It was an environmentally friendly process that released much less carbon.
- ¹² It turns out charcoal is an amazing natural fertilizer that helps the soil stay fertile for thousands of years and also helps to preserve the human evidence in the soil. Today, pedologists (soil scientists) call charcoal that's produced by slash-and-char "biochar."
- ¹³ So did Indians make TPI intentionally, or was it all a happy accident? This question still interests scientists today.
- ¹⁴ The riddle of terra preta does not end here. Scientists are researching dozens of TPI sites throughout the Amazon. Every piece of pottery, splinter of chipped rock, fish bone, and clod of charcoal they collect helps them form a picture of the people who lived there thousands of years ago.
- ¹⁵ Some scientists now believe that more Indians may have lived in the ancient Amazon than anywhere else in Brazil, perhaps numbering in the hundreds of thousands. This is different from all previous theories of human history in the Amazon. Some TPI sites are so large that they may have been the sites of big cities, like the ones described by the early explorers.
- ¹⁶ For today's Amazonians, TPI means a good way to grow food; for some scientists, it is the key that can solve the mysteries of lost prehistoric civilizations.
- ¹⁷ But pedologists around the world have their eyes on one part of terra preta in particular: biochar. If they could duplicate the amazing recipe of TPI, it could improve poor soils globally. Some studies suggest that biochar added to oxisols can increase crop yields by 800 percent.

Name _____ Date _____

¹⁸ Even the process of making biochar is a kind of ecological magic. Carbon gets locked into the charcoal, rather than being emitted into the air. Scientists think biochar could be a major player in reducing global warming.

¹⁹ It looks like the Amazonian gold the Spanish were seeking may have finally been found, but it turns out to be charcoal!



1 Read the sentence from paragraph 8.

Picture a village enclosure in the jungle about 2,000 years ago.

Think about the suffix *-ure*. What is the meaning of enclosure as it is used above?

- (A) a busy space
- (B) a distant place
- (C) a separate area
- (D) a crowded town

Name _____ Date _____

- 2 “Super Soil: The Mystery of Terra Preta” explains the effects of slash-and-burn and slash-and-char methods. Mark the box that shows whether the effect is caused by slash-and-burn or slash-and-char.

Effects	Slash-and-Burn	Slash-and-Char
turns wood to ashes		
turns wood to biochar		
locks carbon into charcoal in the soil		
releases large amounts of carbon into the air		

- 3 What role does paragraph 15 play in the structure of the passage?
- (A) It introduces a new problem about the source of TPI.
 - (B) It summarizes a theory about human history in the Amazon.
 - (C) It clarifies that early explorers knew about the benefits of TPI.
 - (D) It explains why large cities have disappeared from the Amazon.
- 4 What are the benefits of using biochar? Use details from the passage to support your answer.

- 5 According to the passage, what is the result of using biochar when planting?
- (A) Carbon is released into the air.
 - (B) People can settle around the farms.
 - (C) Living matter is changed into charcoal.
 - (D) More crops are produced from the rich soil.

Name _____ Date _____

- 6 How does the diagram support the information in the passage?
- Ⓐ It shows why TPI is a better soil to use than oxisol.
 - Ⓑ It reveals why farmers burned down forests to produce biochar.
 - Ⓒ It explains how oxisol can be turned into TPI by adding biochar.
 - Ⓓ It makes clear why oxisol is the best soil for supporting rainforests.

Name _____ Date _____

Writing

► Read the selection and choose the best answer to each question.

Liza wrote a report about how kids can learn about helping the planet. Read the first part of her report and look for any changes she should make. When you finish reading, answer the questions that follow.

It's Not Only a Game

(1) For my class project I wanted to share an entertaining way to help kids learn about helping the planet. (2) I decided to invent a game that would make players travel around a board. (3) I had to create the beginning and the end of the player's journey around the board and decide how many squares the player would travel. (4) The starting point would be a world with dirty soil, air, and water. (5) So, the end would be a green world that was healthy and happy. (6) Each square would describe a way to harm or improve the world around us. (7) The square would decide which direction the player would move next. (8) For example, if the square described increasing trash in landfills or failing to recycle, the player would have to move backward. (9) If the square described making Earth greener, the player would move forward.

-
- 1 What change should be made in sentence 3?
- (A) Add **First**, to the beginning of the sentence.
 - (B) Add **Soon**, to the beginning of the sentence.
 - (C) Add **Besides**, to the beginning of the sentence.
 - (D) Add **Moreover**, to the beginning of the sentence.
- 2 What change should be made in sentence 5?
- (A) Change **So** to **Later**.
 - (B) Change **So** to **However**.
 - (C) Change **So** to **Although**.
 - (D) Change **So** to **As a result**.
- 3 What change should be made in sentence 8?
- (A) Change **For example** to **Finally**.
 - (B) Change **For example** to **Especially**.
 - (C) Change **For example** to **Furthermore**.
 - (D) No change is needed.

Answer Key: Module 5, Week 3 Assessment

Item Number	Correct Answer	Module, Week, Program Skill	Depth of Knowledge
READING			
1	C	M5W3: Generative Vocabulary: Suffix <i>-ure</i>	2
2	See answer below.	M5W3: Comprehension: Text Structure	1
	turns wood to ashes; Slash-and-Burn turns wood to biochar; Slash-and-Char locks carbon into charcoal in the soil; Slash-and-Char releases large amounts of carbon into the air; Slash-and-Burn		
3	B	M5W3: Comprehension: Text Structure	2
4	See rubric on p. R1.	M5W3: Comprehension: Text Structure	3
	Sample two-point response: Biochar can help improve poor soil conditions and air quality. Biochar is one of the powerful ingredients found in TPI. Scientists believe that adding biochar to poor soil such as oxisol “can increase crop yield by 800 percent.” It is also environmentally friendly to produce since the carbon is not released into the air and is instead kept inside the charcoal. Overall, biochar can help solve the problems of poor soil conditions and global warming.		
5	D	M5W3: Comprehension: Text Structure	2
6	A	M5W3: Comprehension: Text and Graphic Features	2
WRITING			
1	A	M5W3: Grammar: Transitions	2
2	B	M5W3: Grammar: Transitions	2
3	D	M5W3: Grammar: Transitions	2

Constructed-Response Rubric

Points	Description
2	2 points <ul style="list-style-type: none">• Response provides a complete and correct explanation of, or answer to, the question.• Response includes clear and specific explanations, interpretations, and opinions of the text based on effective comprehension, inference, analysis, evaluation, and/or comparison.• Response is supported with details from the text.
1	1 point <ul style="list-style-type: none">• Response provides a partially complete and correct explanation of, or answer to, the question.• Response attempts to include explanations, interpretations, and opinions of the text, but they may be unclear or unsubstantiated, and they show limitation in comprehension, inference, analysis, evaluation, and/or comparison.• Response is supported with limited details (in quantity or quality) from the text.
0	0 points <ul style="list-style-type: none">• Response is incorrect, irrelevant, or not provided.