GRADE 11
SBA REVIEW

ELECTRIC TOMATOES
SUMMARIZE INFORMATIONAL AND TECHNICAL TEXTS*
When a caterpillar feeds on a tomato leaf, the plant moves swiftly to protect itself, systematically releasing “proteinase inhibitors”—proteins that interfere with the caterpillar’s digestion—throughout the plant, especially in the leaves. But how does the message get from the wounded leaf to the rest of the plant?

Most scientists believed the alarm was spread by chemical messengers until a team of researchers headed by David Wildon—a biologist at the University of East Anglia in Norwich, England—made a shocking discovery. An injured leaf, the researchers found, sends an electrical signal to warn neighboring leaves of imminent danger. It’s a “terribly tiny current” driven by an electrical potential difference of only 20 millivolts, says Wildon, who measured the voltage after electrodes were attached to the plant’s surface.

“Right now, all we can say is that there is a correlation,” Wildon notes. “If you wound the plant, you’ll see an electrical signal accompanied by a biochemical response.” To learn more about the reaction, Wildon’s team plans to insert electrodes within the plant tissue (rather than on the surface) to determine what’s going on at the cellular level. The findings may help explain other mysteries surrounding plants. For example, many plants start to flower in springtime, as days grow longer, but plants sense the change in the day length through their leaves, while flowers begin to bloom at the buds. “There must be a signal from the leaf to the growing points,” Wildon says. “So far, no one has come up with a convincing chemical mechanism. Maybe an electrical signal is involved.”
QUESTIONS

Benchmark I-C1: Make reasonable inferences from implied ideas to predict outcomes, derive reasonable generalizations, differentiate fact from opinion, and differentiate literal from figurative meanings.

1. What is the function of the “proteinase inhibitors” in tomato plants?
   F. They produce electrical impulses.
   G. They create nutritional substances.
   H. They protect the plant from insects.
   I. They protect the plant from diseases.

2. Prior to this research, most scientists believed that plants spread alarms through
   A. chemical signals.
   B. physical messages.
   C. biological mechanisms.
   D. electrical transmissions.

3. What question do scientists hope to answer with further research?
   F. Do plants send chemical messengers that register pain?
   G. Do plants create cell tissues that help rebuild the leaves?
   H. Do plants create proteinase inhibitors that warn them of danger?
   I. Do plants send electrical signals that tell them it is time to grow?

Benchmark VII-B2 – Produce accurate summaries and effective critiques of information and technical texts

4. You have been asked to write a science report summarizing the information found in the article “Electric Tomatoes.” In your report, include a brief summary of the main points of the article and why the information presented might be helpful for future research according to the article.

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5. **What idea BEST describes the author’s purpose in writing this article?**

   A. to improve future research  
   B. to defend controversial research  
   C. to describe the results of new research  
   D. to correct the results of inaccurate research
ANSWERS

1. H
2. A
3. I
4. EXAMPLE OF A TOP-SCORE RESPONSE:

Scientists have discovered that when one part of a plant is injured, it releases proteinase inhibitors which protect the entire plant. They realized that some kind of signal was being sent from one part of the plant to the rest of the plant and initially believed that this signal was chemical in nature. Then, biologist David Wildon conducted an experiment with electrodes and plants, which led him to believe that an injured leaf sends an electrical signal as a danger alert to the rest of the plant. In Wildon’s future research, he plans to learn more about this electrical signal. This research is important because it may help us understand other mysteries about plants, such as how they receive their information about when to grow and flower.

5. C