

NCERT Solutions for Class 10 English

Footprints Without Feet Unit 6

The Making of a Scientist Class 10

Unit 6 The Making of a Scientist Exercise Answers & Summary

Read and find out : Solutions of Questions on Page Number : 32

Q1 :

How did a book become a turning point in Richard Ebright's life?

Answer :

By the time Richard Ebright was in the second grade, he had collected all twenty-five species of butterflies found around his hometown. According to him, this would probably have been the end to his butterfly collecting. However, a book made him think otherwise. The book titled 'The Travels of Monarch X' became a turning point in his life. The book was about how monarch butterflies migrated to Central America. This opened up the world of science to the eager young butterfly collector. At the end of the book, readers were invited to help study butterfly migrations. He actively participated in tagging butterflies to help in the research being conducted by Dr Frederick A. Urquhart. He went on to raise an entire flock of butterflies in the basement of his home. Thus, it can be said that the book had managed to keep his enthusiasm alive by making him aware of the never-ending possibilities in the world of science.

Q2 :

How did his mother help him?

Answer :

Richard Ebright's mother helped him by encouraging his interest in learning. She took him on trips, bought him telescopes, microscopes, cameras, mounting materials and other equipments, and helped him in many other ways. If he did not have anything to do, she found things for him to learn. Even the book that became a turning point in his life was given to him by his mother. Hence, it can be said his mother played a crucial role in the making of the scientist.

Q3 :

What lesson does Ebright learn when he does not win anything at a science fair?

Answer :

When Richard Ebright did not win anything at the science fair, he realized that the winners had tried to conduct real experiments. He, on the other hand, had simply made a neat display. He had shown slides of frog tissues under a microscope. It was the first time that he got a hint of what real science was. This event served to develop the competitive spirit in him. Ultimately, it was this spirit of enthusiasm and competitiveness that drove him to achieve new heights in science.

Q4 :

What experiments and projects does he then undertake?

Answer :

After losing out at the science fair, Richard Ebright undertook various experiments and projects. For his eighth grade project, he tried finding the cause of a viral disease that killed nearly all monarch caterpillars every few years. He tried raising caterpillars in the presence of beetles as he thought the disease might have been carried by a beetle. He did not get any results. However, he went ahead and showed that he had tried the experiment, and this time he won.

The next year, his science fair project was to test the theory that viceroy butterflies copied monarchs in order to prevent being eaten by birds. His project was to see whether birds would eat monarchs. He found that a starling would not eat ordinary bird food, but ate all the monarchs it could get. This project was placed first in the zoology division and third overall in the county science fair.

In his second year at high school, he began the research that led to the discovery of an unknown insect hormone. Indirectly, it also led to his new theory on the life of cells. He tried to find the purpose of the twelve tiny gold spots on a monarch pupa. Along with another excellent science student, he built a device which showed that the spots were producing a hormone necessary for the butterfly's full development. This project won the first place in the county fair and also an entry into the International Science and Engineering Fair, where it was adjudged the third best in zoology.

As a high school junior, he continued his advanced experiments on the monarch pupa. His project won first place at the International Science fair.

In his senior year, he grew cells from a monarch's wing in a culture and showed that the cells would divide and develop into normal butterfly wing scales only if they were fed the hormone from the gold spots. That project won first place in zoology at the International Fair.

The summer after his freshman year at Harvard, Richard worked on the hormone secreted from the gold spots, and was able to identify the chemical structure of the hormone. During his junior year, he got the idea for his new theory on the life of cells. Along with his room-mate, James R. Wong, he worked on his theory and wrote a paper explaining the same.

Q5 :

What are the qualities that go into the making of a scientist?

Answer :

The author mentions three qualities that go into the making of a scientist—a first-rate mind, curiosity, and the will to win for the right reasons. Richard Ebright was a very intelligent student. He was also a champion debater, a public speaker, a good canoeist and an expert photographer. He always gave that extra effort. He was competitive, but for the right reasons. From the first he had a driving curiosity along with a bright mind; and it was this curiosity that ultimately led him to his theory about cell life.

Think about it : Solutions of Questions on Page Number : 38

Q1 :

How can one become a scientist, an economist, a historian...? Does it simply involve reading many books on the subject? Does it involve observing, thinking and doing experiments?

Answer :

This question requires you to use your own perspective as well as your analytical skills. The answer to the question would vary from one person to another. It is suggested that you read the text carefully and try attempting it on your own.

Q2 :

You must have read about cells and DNA in your science books. Discuss Richard Ebright's work in the light of what you have studied. If you get an opportunity to work like Richard Ebright on projects and experiments, which field would you like to work on and why?

Answer :

This question requires you to use your own perspective as well as your analytical skills. The answer to the question would vary from one person to another. It is suggested that you read the text carefully and try attempting it on your own.