

NCERT QUESTIONS WITH SOLUTIONS

Read and Find Out

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

Ans. Richard Ebright was interested in collecting butterflies. 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. But at this point his mother got him a book called 'The Travels of Monarch X'. This book told him about the migration of monarch butterflies to Central America. This book aroused his interest in Monarch butterflies and opened the world of science to him. He began to raise Monarch butterflies in the basement of his home, and study them in different stage of their development. 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. 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.

2. How did his mother help him?

Ans. 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.

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

Ans. 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.

4. What experiments and projects does he then undertake?

Ans. 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.

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

Ans. 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

1. 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?

Ans. Reading books is just one aspect of learning. This is an exercise in information gathering. It is how your brain processes the information that affects the degree of learning. The first and the foremost criteria to become a genius in one's chosen field is to have a great curiosity and unending hunger to discover more. Next criteria is a good sense of observation which helps you to correlate your findings with what you see or experience in the real world.

Experiments are just to test your findings against possible variables and in real life situations. And last, but not the least criteria is an urge to work really hard on your area of interest.

2. You must have read about cells and DNA in your science. 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?

Ans. Ebright's work is directly related to Biology. Discovery of cell's structure has helped the scientific community to understand the way any organism functions and grows. This has helped scientists to discover how disease-causing organisms attack us and grow inside our body. This must have given the idea to counter a particular disease. DNA fingerprinting is helping police to pinpoint the real culprit.



Monarch Butterfly

This was not possible when DNA was discovered. Monarch butterflies present an amazing example of a tiny creature migrating thousands of miles from North America to the rainforest of Amazon. Someday, we can be in a position to develop as sturdy and reliable navigation system as that of the Monarch butterflies.

Talk About It

1. Children everywhere wonder about the world around them. The questions they ask are the beginning of scientific inquiry. Given below are some questions that children in India have asked Professor Yash Pal and Dr Rahul Pal as reported in their book, Discovered Questions.

(i) What is DNA fingerprinting? What are its uses?

Ans. DNA fingerprinting is a forensic technique used to identify individuals by the characteristics of their DNA. 99.9% of human DNA sequences are same in every human being. But the rest DNA sequences have so much variation that they cannot be same in two individuals; except in monozygotic twins. This variation can be profiles through DNA fingerprinting or DNA profiling.

Uses of DNA Fingerprinting:

- (a) In establishing the parentage of a person.
- (b) In identifying a criminal.
- (c) In identifying a dead person if the dead body is damaged beyond recognition.

(ii) How do honeybees identify their own honeycombs?

Ans. Honeybees have signalling chemicals; like many other insects. They leave trails for fellow honeybees so that they can reach a source of nectar or honeycomb. Honeybees also communicate through complex dance patterns to show the distance and direction of a flower or of honeycomb. It is believed that they take the help of location of the sun to find their direction.

(iii) Why does rain fall in drops?

Ans. We know that rain is formed because of condensation. Soon after condensation, the water vapour turns into tiny ice crystals. Since all of the vapour in atmosphere does not condense at once, hence there is no possibility of formation of a large pool of water. The tiny ice crystals further melt into water when they travel down. Thus, rain falls in drops. Sometimes, when the size of ice crystals is large or condensation is too fast, we experience hailstorms instead of rains.

2. You also must have wondered about certain things around you. Share these questions with your class and try and answer them.

Ans. Yes, I have wondered about some certain things around me. Those questions and their answers are as following-

(i) Why does sky appear to be blue?

Ans. Our earth is surrounded by a blanket of air called the atmosphere. Sun is the main source of light for the earth. When the sunlight passes through the atmosphere, it is scattered by the dust particles, water and air molecules in all directions. The sunlight is composed of seven colours which are violet, indigo, blue, green, yellow, orange and red. When the sun rays pass through the atmospheric molecules, the violet, indigo and blue colours get reflected the most. When we look at the sky, the light which enters our eyes mainly consists of violet, indigo and blue colour. The mixture of these three colours is almost blue. So the sky appears blue.

(ii) Why does blood group vary from person to person?

Ans. Our blood is mainly composed of red blood corpuscles, white blood corpuscles, platelets and plasma.

Microscopic investigations reveal that molecules of antigen found on the surface of red blood corpuscles are different in different people. This difference in the antigen gives rise to different groups of blood.

(iii) Spiders don't get caught in their own webs. Why?

Ans. The spider does not get caught in its web because a kind of oil is secreted on its legs. When the spider moves across the web, it is careful to avoid touching the sticky threads with its legs. If sometimes it does so, the oily secretion on its legs prevents it from getting caught in the web.
