

Serendipity and scientific discoveries

Pablo Picasso used to say: 'Inspiration exists, but it has to find us working.' What did he mean? Do you think we can find similar situations in science? Have you ever thought about how scientists come up with brilliant ideas to solve problems? **German Tenorio** explores the role of serendipity in science

The nature of science (NOS) section in the IB guide of the science courses (biology, chemistry and physics) helps us to realise and understand that science (and scientific work) is not just carried out by a single scientist following several steps of the scientific method. Actually, science depends on interactions with the shared knowledge within the scientific community, repeating the different parts of the scientific method by different people at different times in order to obtain new information. In addition, the scientific process is not something static carried out in a lab, but it is a dynamic and, most of time, unpredictable process. Finally, creativity is an important factor in science, because in discovering new things or explanations to a problem, new approaches to the same problem must be given.

Science is mostly based on careful observations behind a tireless process of research, such as the use of Rosalind Franklin's X-ray diffraction, which provided definitive evidence that DNA is a double helix, or Michael Faraday's observation of electromagnetic induction. However, some of the most important discoveries, such as the discovery of penicillin or radioactivity, are clear examples of how lucky events have a deep impact on scientific discoveries.

You may think that someone could make a scientific discovery by a stroke of luck, but in fact, this is far from being true. Although

anyone could find a coin on the ground by chance, not everybody can realise that an incorrect result from an experiment can be used as an application to solve another problem. Scientific discoveries where chance is involved are known as **serendipitous events**.

Serendipity and TOK

Although the word 'serendipity' is often used as a synonym for 'chance', serendipity is not just chance. While we recognise chance as something opposite to rationality or critical thinking, serendipity presupposes a fluency with relevant knowledge that has already been established in a community. In this sense, serendipity is defined as the rational exploitation of chance, especially in the discovery of something useful or beneficial. One important aspect that has to be taken into account in order for an event to qualify as serendipitous is that the thing discovered is something that the discoverer had not been looking for.

So serendipity is associated with discoveries that are not just down to chance, but arise from it, together with an intellectual effort that derives the discovery from the chance event. The TOK course identifies eight specific ways of knowing. Intuition is one of them, which is often regarded as knowing without the use of rational processes. To what



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JE Gale



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