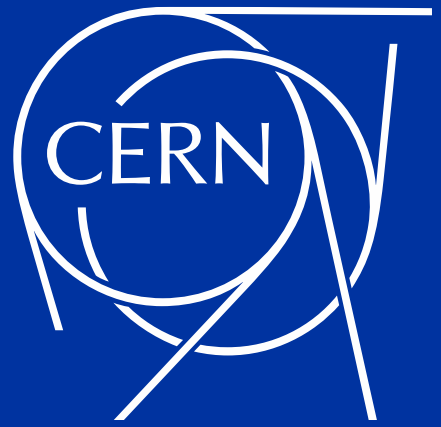
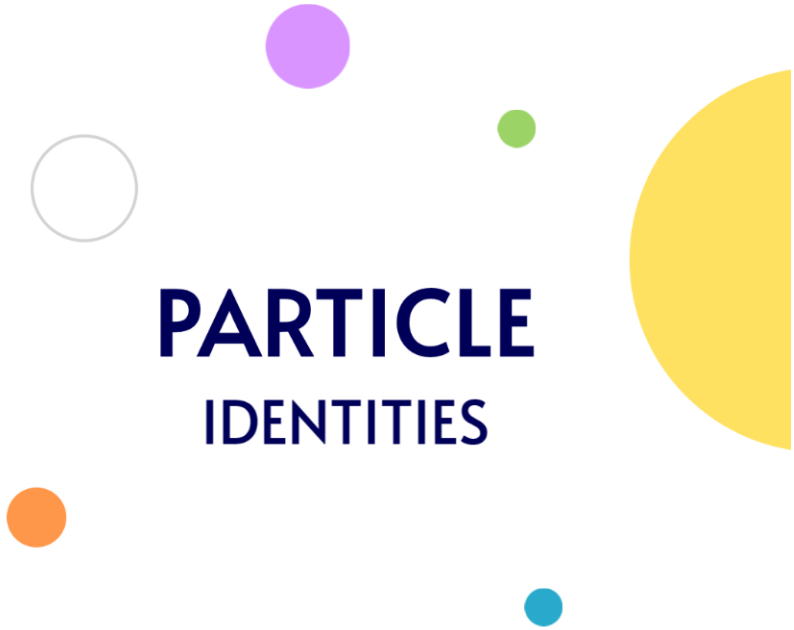


Mystery Box Workshop

Dr. Jeff Wiener

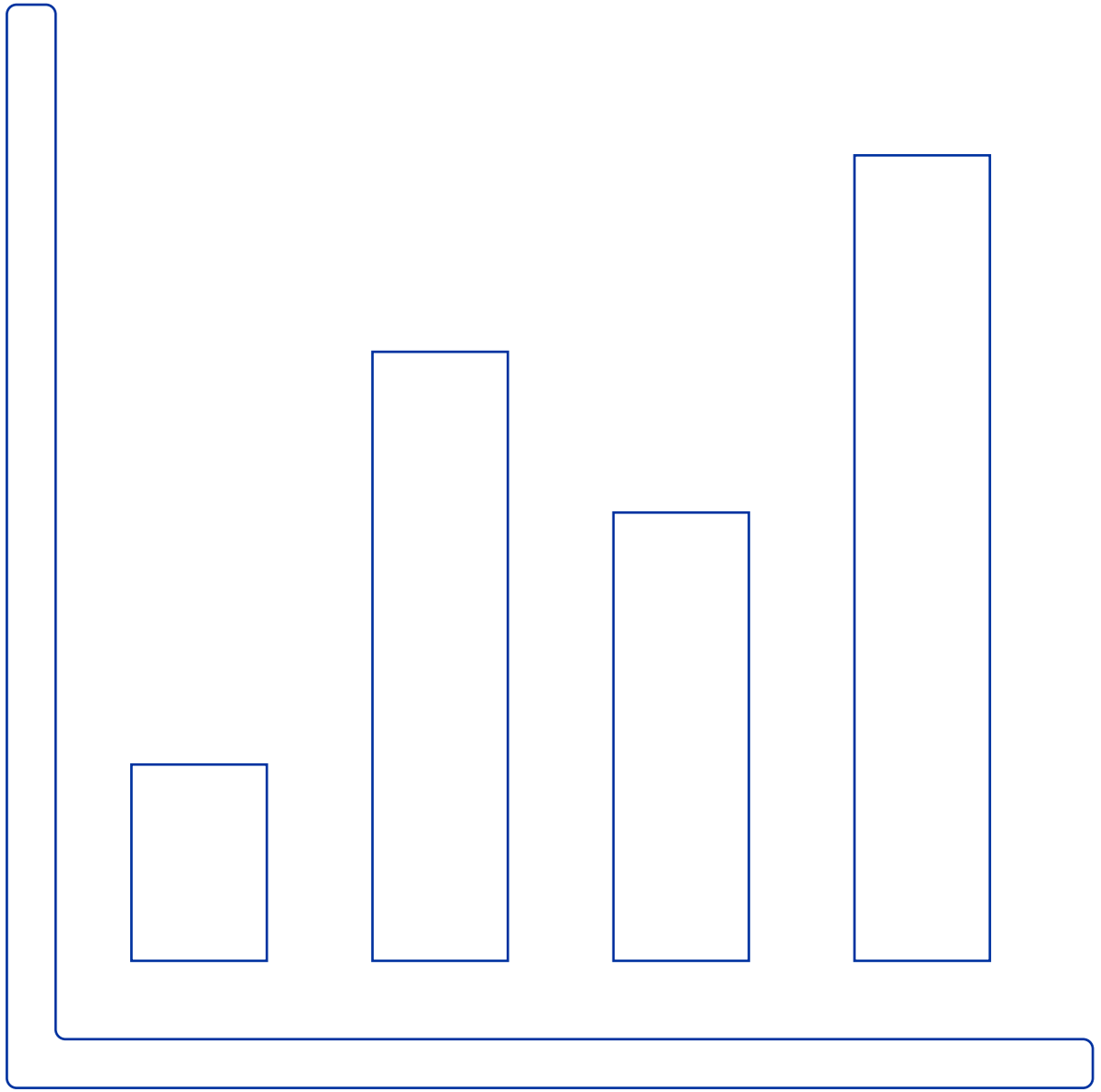
31 October 2022



cern.ch/identities

Nature of Science

- Theory-laden
- Empirical & inferential
- Creative
- Tentative
- Social & cultural embeddedness



Higgs in a Box

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The mystery box challenge: explore the nature of science

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Thinking outside the box: Explore the nature of science by building LEGO mystery boxes and challenging your students to solve the puzzle.

How do we make informed decisions based on scientific evidence? Learning about the nature of science can help us with that challenge. The nature of science describes the values and underlying assumptions that are intrinsic to scientific knowledge. As such, understanding the nature of science is considered to be the core of scientific literacy.[1]

Research shows that different aspects of the nature of science are important for high-school students and should be taught explicitly.[2,3]

This activity teaches students the following:

- scientific explorations are guided by scientific theories;
- science is empirical and inferential;
- science is creative;
- science is tentative;
- science is a social endeavour.

Mystery-box activities are a powerful educational tool for teaching nature-of-science concepts.[4,5] Mystery boxes come in various shapes and sizes, from closed boxes with simple everyday objects to water-based mystery boxes with systems of water tanks. You can find out more about different mystery boxes on the S'Cool LAB website: https://scoollab.web.cern.ch/mystery-boxes.

www.scienceinschool.org/article/2022/mystery-box-challenge

Figure 1: LEGO mystery box with a hidden internal structure

Image courtesy of the authors

Mystery boxes in the classroom

Activities with mystery boxes support students in experiencing different scientific methods and increase their understanding of the nature of science. These mystery-box activities can be used with students aged 14 and above and can be completed in around 90 minutes altogether, although teachers can decide to spend more time on the discussion.

1

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