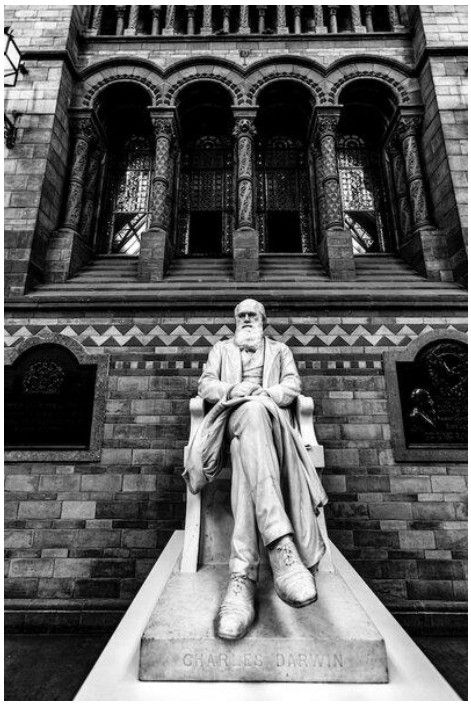
Evolution in the animal and plant kingdom



The following workshop serves as a best practice example how to design a teacher training workshop in collaboration with a Science Centre.

School Level: Lower and Upper Secondary School (12-18 yrs.)

Keywords: Scientific Literacy, Effective Learning Environments, Challenge- and Place-based Learning, Sharing and dissemination of learning, Expert and peer-supported, Incorporates reflection

Summary:

Prof. Dr. em. Gerhard Haszprunar (former Director General of the Natural History Collections of the Bavarian State (SNSB)) is giving two lectures in the morning (each with a discussion):

1. ‘The evolution of the ego’ - A journey through neuro- and developmental biology, human genetics, palaeoanthropology and primatology, a dash of placebo medicine and a little optical illusion will explain the origin of man and his mind.

2. ‘Unintelligent design in the animal kingdom - evolution does not plan’ - The new curriculum in Bavaria formulates the following content for evolution: differentiation between scientific and non-scientific ideas. Many biology teachers are confronted with creationist ideas on the subject of evolution. ‘Intelligent design’ - the complexity of living beings requires an intelligent designer - plays a significant role here. In order to raise expertise on this issue, the lecture will explain a series of catchy ‘unintelligent’ examples from the animal world, but also from the human body. It will also explain how complexity and blueprints can arise from chance

Dr. Simon Pfanzelt (curator in the Botanical Garden Munich (SNSB)) will give a guided tour through the Botanical Garden entitled ‘Evolution illustrated by concrete plants’. The tour will deal with various aspects of the evolution of plants, which will be illustrated using concrete examples. Among other things, methods for analysing relationships, various species concepts, speciation, adaptive radiation, population genetics and convergent evolution will be discussed. Questions on genetic engineering and genetic manipulation will also be addressed.

Teachers Learning Outcomes:

The designed workshop activity has several potential learning outcomes for teachers, based on the content of the lectures and the guided tour:

1. Enhanced Understanding of Evolutionary Concepts

Teachers will gain a multidisciplinary understanding of the evolution of the human mind, integrating neurobiology, genetics, and anthropology. This will enable them to approach human evolution in a comprehensive manner, enhancing their ability to teach these complex topics in an engaging and scientifically accurate way.

The workshop addresses common controversies such as “intelligent design” versus evolutionary theory. Teachers will be better prepared to handle such topics in the classroom, providing students with scientifically grounded information while respecting diverse viewpoints.

2. Critical Thinking and Analytical Skills

Teachers will develop critical thinking skills by engaging with the philosophical and scientific discussions presented in the lectures. They will learn to analyse and interpret complex information, which can be applied to classroom teaching, helping students to develop similar skills.

3. Pedagogical Skills for Teaching Evolution and Related Topics

By exploring practical examples from plants, the animal kingdom and human anatomy, teachers will gain new strategies for making the concept of evolution more tangible and relatable to students. They will be better equipped to create lesson plans that are both informative and engaging, using real-world examples to illustrate evolutionary principles.

4. Application of Modern Research and Concepts in Education

Exposure to current research and modern examples in evolutionary biology will help teachers stay updated with the latest scientific knowledge. This will enhance their confidence and credibility when teaching these topics.

These outcomes align with the goals of the SYNAPSES project to empower teachers with the knowledge and skills needed for effective teaching, particularly in areas related to sustainability and scientific literacy.