

**MODULE 3****STEM Project-Based Learning: Authentic & Effective Experiential Teaching and Learning**

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**DESCRIPTION**

In a world of globalisation and connectivity, authentic and experiential teaching and learning is of paramount importance. Curiosity, problem-solving, critical thinking and creativity skills are crucial for the learner of today. As such, STEM project-based learning using the design cycle and applied use of technology is becoming crucial for capacity building in schools. Therefore, in both these modules, through the development of hands-on projects or experiments, teachers will gain a different perspective on how to engage students with syllabus content of STEM disciplines.

**LEARNING OBJECTIVES**

Throughout the module participants will:

- examine and discuss the value of project and theme based approaches to learning science
- compare existing curriculum approaches; “2-D vs 3-D”
- list and contrast themes and concepts in our subject areas
- develop ideas for project based learning opportunities
- construct and carry out a project based learning experience relating to sustainable development goals (SDGs)
- learn how to develop and use assessment tools
- link this module with the others in the CERN – South Asia Science Education Programme
- share experiences, tips and tricks for effective teaching, learning and assessment in STEM areas

**THEORY**

Participants will achieve the above learning objectives by:

- revealing their present practice and taking part in a discussion focusing on the evolution of science teaching and its inter-relationship with technology and real life problems.
- identifying the commonalities and key ongoing developments between science curricula, local and international.
- developing an understanding of key terms involved in concept based STEM learning
- analysing curricula goals in order to develop possible project based activities
- taking part in a hands-on exercise allowing participants to fine tune their learning activity design and to gain insight into the student experience
- designing assessments for the range of micro concepts involved in the activity carried out and others; examining different forms of assessment for learning that could be used
- taking part in a round table sharing exercise highlighting strategies that are effective and issues that might need to be overcome

**PRACTICAL/HANDS-ON**

- *Develop an enquiry based project / unit addressing the macro concept ‘Sustainability’*
- *Build a classroom based wind farm using low-tech, low budget materials*