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1 An initiative to introduce geosciences to elementary schools: Concepts, projects and experiences

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An initiative to introduce geosciences to children in elementary schools has been undertaken during the last two years in the city of Bremen. Up to now geoscientific themes have been of peripheral importance within the framework of teaching general knowledge. However, young school children have a strong interest in all questions dealing with Earth and life on Earth. Geological sciences is arguably the most interdisciplinary of the sciences. It encompasses all aspects of the physics, chemistry and biology of the Earth, augmented by the perspective of deep time. It can be regarded as a cornerstone of science education

because it offers the basis for understanding the physical world around us. The project aims to stimulate and foster scientific literacy of children at a very early age.

The concept is based on the fact that children have a natural interest and curiosity. The children are encouraged to carry out simple experiments, describe observations and draw their own conclusions with the major goal of achieving an early understanding of basic scientific principles. The implementation of their own experiments fosters fundamental practical skills, strengthens recollection, and stimulates further steps in exploratory activities. At all stages of a workshop a playful approach to scientific questions and methods is preferred. The project gains by the children's natural ability to think across disciplines and to bring individual observations into larger contexts. A set of basic experiments may help to demonstrate and understand global concepts (i.e., the water cycle). Raising scientific questions is used to promote scientific perception and understanding. The project also intends to give advisory help to schools and teachers and to extend existing teaching programs. It also aims to enhance interest in scientific questions and studies and offers insights to scientific professions.

We started our project two years ago within the

UNISCHULLABOR at the University of Bremen [1], which was originally designed to appeal to children in secondary schools, and then opened it to elementary schools. Recently, several activities (both public lectures and workshops) were carried out during the 1. and 2. BREMER KINDER-UNI [2]. In an additional step we worked with children in elementary schools, designed "afternoon experiments" during after-school care for children, and performed basic training of teachers and educators in geoscientific topics. Project weeks during school and holidays were established in some elementary schools in Bremen, focussing on natural sciences.

The initiative is well accepted and frequented by teachers, children and parents. The university campus is well suited as a place to learn outside of school and offers the opportunity to become acquainted with scientists and their profession. Recurring visits in elementary schools provide opportunities for more personal contact and more intensive reflections of scientific topics. In all cases children expect plausible explanations for their questions. Pure demonstration of phenomena is not accepted. Our experience indicates that it is crucial to determine the level of existing knowledge prior to instruction. Scientific coaching for the teachers was also important during cooperation. It

is recommended that a permanent link be established between Universities and elementary schools. New approaches should to be established in the education and further education of teachers.

References

[1] UNISCHULLABOR, Universität Bremen, http://www.unischullabor.de/

[2] BREMER KINDER-UNI, http://www.kinderuni.uni-bremen.de/