

Student science continuation study on rocks and minerals weathering experiment 2

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I have been instructing the continuation study to check rocks and minerals change experimentally as a student study of junior high school science club for 23 years. In this continuation study, I have valued the study of the change basalt and fayalite with ultraviolet rays and the water most. This study is for a purpose to clarify one of the causes with much iron oxide on Mars. Therefore, students irradiate ultraviolet rays to the basalts and fayalites soaked into purified water and check their change. There is much basalt and fayalites on Mars probably. In addition, it is estimated that water existed on past Mars. Therefore, in past Mars, it is thought that ultraviolet rays and water were one of the factors to change rocks .

At first I am interested in the study and I decide directionality and the plan of the study of science club and prepares for tools. And the student who was interested in the study joins the scientific club and studies it. In other words it is a teacher-led science continuation study, but values the idea and opinion of the students. In a junior high school and the elementary school science, I think that such a teacher-led science study should be carried out more lively in Japan. And I think that it is easy to practice such a teacher-led science continuation study in the field of earth planet science and the field of biological science in particular.

Keywords: student study, ultraviolet rays, water, fayalite, basalt, change

Planning and practice of our delivery lecture at Betsukai elementary school

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Triggered by the Tohoku Earthquake on March 11, 2011, science education for disaster prevention and mitigation, are reviewed the importance of earth science education, especially in the field of education. However, we hear often from teachers in elementary school, junior high, and high school. "There are no instructional materials about local geology and geomorphology on the science textbook around here.

Kazuto Ishiwata in Betsukai museum was consulted me about "In the study period, which is expected to occur in November, I want you to plan visiting lectures about local geology for target 13 people in grade 5 and 6 of Betsukai elementary school ". At that time, it was to be three students from Hokkaido University of Education, Kushiro branch aimed at teachers in future come in field training associated with Prof. Yasuo Ikeda. Therefore, we plan to conduct a special science class with them in Betsukai elementary school in last November. We will report our planning delivery lecture at Betsukai elementary school about "Let's examine the origin of land using by geological and geomorphological information!" and responses from students.

Keywords: Betsukai elementary school, delivery lecture, geomorphology and geology, origin of land, eastern Hokkaido, marsh

Computer Based Educational Seismology System for Regional Elementary School Students

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Japan is one of the most seismically active countries in the world. Catastrophic earthquake can happen anywhere in the country and large offshore earthquake sometimes cause destructive Tsunami. Since no one can predict the exact date and location of the earthquakes, it is important to get prepared in advance to protect their homes and families. For this purpose, education of disaster preparedness is crucial for everyone. After the 2011 great Tohoku Oki earthquake occurs, importance of the education of disaster preparedness was rediscovered and various educational activities were held in schools and other public facilities. However the mechanism of earthquake itself (Why and how it happens, why the strong ground motion can be generated, what controls the ground motion intensity, etc.) is rarely taught in the classroom. Both comprehensive knowledge of the earth science and disaster drill should go together for the effective disaster prevention. In addition, the education of the earth science including seismology for younger generation is very important to encourage them to be a future scientist or/and leader of disaster prevention. In this study, we develop a computer based educational seismology system targeted for elementary school students. The system will be aimed at being used in the classroom to support their better understanding of earthquake and earth system. Prior to this project, we performed a series of survey in the local elementary school to figure out what teachers want for this type of learning system and how to adopt it in their class. Based on the survey, we developed a prototype of the system. Since it is targeted for little children, we made efforts so that it to be not only practical but also enjoyable. For example, as the prototype, we developed the computer game to determine the hypocenter of earthquakes, which is practical and visually enjoyable. In the game, students will pick P- and S-wave by themselves and compete the score. Furthermore, since we are trying to distribute the system to the local elementary school, we included the learning contents of the local geology, tectonics and historical earthquakes in the system so that they can learn them effectively and prepare for the future earthquake that affects their home town.

Keywords: Disaster prevention education, Educational seismology, Outreach, Computer game, Elementary school

A direction of geographic education for disaster prevention after Great East Japan Earthquake

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One perspective from environmental education after the Great East Japan Earthquake (GEJE) gives us an opportunity to rethink the following attitude: learning about nature and physical environment makes you a person solving problems among them. This can be described as the gap between recognize and action. This concept is lack also in geographic education, where recently problem solving learning often carried out on the context of Education for Sustainable Development.

The aim of disaster prevention education in school is to foster children's competence for recognition and action about disaster and its prevention. However in geographic education so far, the learning approaches were categorized in 2 patterns as point out the correlation between disaster and topographic condition through evaluating map and aerial photographs (1), and find out place of danger with comparing old-new topographical map (2). They were just recognize approach for disaster and would lead to scientific rational recognition like hazard map. The action was not to be in considered. Moreover GEJE shows us the needs of mental- and ethical behavior should be foster in education. Against these challenging ethics education offer a new approach from the theoretical background of Kohlberg's stages of moral development. Life is getting to be an issue also in geographic education.

This presentation shows the cross-linking approach of scientific rational- and ethical aspects of disaster prevention education with concrete example.

Keywords: Great East Japan Earthquake, Geographic Education, Education for Disaster Prevention, Education for Sustainable Development, cross-linking approach