

## Some recent efforts and future activities of JpGU for the next high school national curriculum revision

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From 2012, the new national curricula standards has been in effect according to Ministry of Education, Culture, Sports, Science and Technology guidelines.

Among most high school students three or more subjects are chosen from the following four subjects; Basic Physics, Basic Chemistry, Basic Biology and Basic Geoscience.

As a result, The number of students who choose Basic Geoscience in 2014 has increased by about 3.5 times compared with that of the number under the former national curriculum guidelines, and some improvement came to be seen in people's geoscience literacy.

During this time, the Educational Affairs Committee of JpGU, in preparation for the next national curriculum revision, consider the way of desirable high school geoscience education through preliminary discussion in the study meeting (December 2012) and symposium (May 2013).

In order to raise geoscience literacy, it is necessary for the number of students studying geoscience to increase even more.

It is necessary to discern what is asked of high school geoscience education by society, and include the appropriate contents.

In order to allow students to learn the content effectively, we need to discuss what kind of subject setup is desirable.

In this session, based on the discussions so far, we present three drafts about the subject setting of a high school geoscience with different points of view. In addition, we plan to deepen discussion about the future direction of geoscience education taking into consideration the presentation about expectations for geoscience education from people who do not specialize in science.

Keywords: next national curriculum revision, high school geoscience education, subject setting

## Suggestion of the modified selective subject based on the current Basic Earth Science

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Current basics subjects (2 credits) are subjects set based on mind of science for all, and the contents are veneer knowledge. However, it is thought that these basic subjects contribute to the improvement of good scientific literacy upbringing of the balance of the high school student's knowledge because a study rate of all subjects of four subjects of science rose because three subjects of science choice are required. In addition, it is realistic subject setting when based on the situation to teach the subject that does not match a specialty of a high school science teacher.

However, as contents of basics subjects are broad and veneer and have not the learning a principle and structure, the memorized tendency of the item is deeply concerned. Based on this reflection, we want to propose a new Basic Earth Science including contents learning a principle and structure by the selection of contents of the current basics subject carefully.

Keywords: Basic Earth Science, careful selection of contents, selective subject

## Suggestion of the new high school general science with the contents necessary as earthian

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Existing national curricula standards(N.C.S) in high school require 3 basic sciences of the 4 basic sciences, an improvement on the former N.C.S. But it is not enough for students to only study 3 basic subjects for coming to a deeper understanding of their place in earth's ecological system.

Therefore we would like to propose two new types of 'General Science' which need 4 credits or 6 credits in school classes.

One type integrates four science subjects into one compulsory subject with the aim of developing better understanding of the global environment and sustainable society,and is based on learning of the problem solution type with high regard for key competency. The other type is to divide 4 basic sciences into 2 subjects in order to understand science literacy, and consists of 'physics and chemistry' and 'biology and earth science' at this time, we want to suggest the former, which integrates four basic science subjects.

Keywords: general science, compulsory subject, problem solution type, understanding global environment scientifically

## Proposal of novel compulsory subject which is mixed Geoscience, Geography, environment, and natural disaster prevention

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The subcommittee of school curriculum at the committee of school education at Japan Geoscience Union (JpGU) has investigated into the contents of Earth and Planetary Sciences and its related Sciences of next and future subjects of upper secondary schools based on the next and future national standard curricula in Japan. We would like to make 3 types of subjects and their contents. In this presentation, we will report novel compulsory subject of them.

This novel compulsory subject will be invented based on new concepts which break down long-established the framework of current subjects. The contents of this subject consist of geoscience, geography, environment, natural disaster prevention, and so forth. The educational purpose of this subject is to acquire the scientific literacy and the attainment ability of type of PISA, Programme for International Student Assessment, through the ability of natural and social sciences. As a result, students will be able to get ability to take action and thinking faculty for environmental problem and natural disaster prevention by themselves scientifically.

Keywords: Novel Compulsory Subject, Upper Secondary School, Geoscience, Geography, Natural Disaster Prevention, Environment

## My Expectations to High School Subject "Earth Science" under the New National Curriculum Standard in Japan

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The new national courses of study in science education of high schools implemented formally in 2013 have asked high school students to choose 3 science subjects from 4 subjects such as physics, chemistry, biology and earth science. This revision has led to following changes; First, the number of students to choose earth science has drastically increased and most of them tend not to study earth science deeply, but to regard it as sort of general education. Second, and what counts most is, their interests in the most important problems of the global environmental issues are increasing. If these tendencies are continued to be seen, new earth science as a high school subject shall have a very serious and critical mission to enhance student's general science literacy and their motivations for engagement or action in solving those real life problems, while they must be active to make effective conditions of the sustainable development in our human life as well as in all kinds of life on the earth.

Keywords: science education, earth science education, global environmental issues, education for sustainable development (ESD)