Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

GEJ020-01 Room:301A Time:May 22 09:00-09:15

Science class using a digital 3-D globe, Dagik Earth

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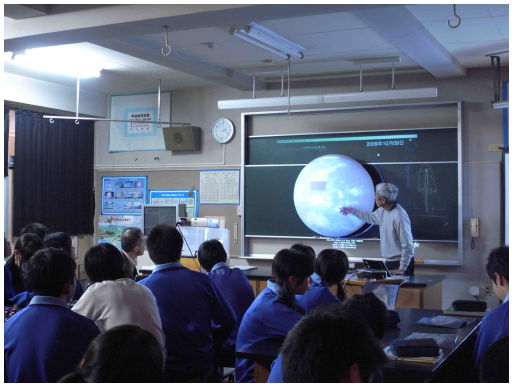
We have developed a portable, scalable and affordable 3-dimensional digital globe system to present the Earth scientific results. It is called Dagik Earth. Dagik Earth is an educational project to enjoy the scientific outputs on the earth and planets with three-dimensional digital globe in classrooms, science centers and home. Several science class and workshops of Dagik Earth have been done in elementary schools and junior high schools. Especially in junior high schools, science class on the weather system in Japan has been carried out in several times. The 3-dimensional globe can be attached on the black board, and the Earth images with clouds can be projected on the globe. The three dimensional presentation is the only way to present the correct shape on the Earth while any map distorts the shape. In the presentation, we introduce the system of Dagik Earth, educational programs using it.



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GEJ020-02 Room:301A Time:May 22 09:15-09:30

Development of Venus Live Telescope as Teaching Material

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To teach students astronomy at school, we would like students to actually look at the stars. Unfortunately, the chances of seeing stars at school is very few due to the inability to see stars during the day time and due to bad weather conditions.

For students to observe stars during the day time, I created the Venus Live Telescope. Venus can be seen during the daytime through a telescope, but not through the naked eye. So, I created a system that can observe Venus by using a telescope in real time. Then the telescope transmits live images to a monitor that is inside the classroom. Currently, this system is being used at junior high schools .

To view Venus during the day time, I used the SKYPOD. It can find where Venus is located at, automatically. The product is not so expensive, which is nice. In order to find Venus, face the telescope towards the sun in the west horizon and then the telescope will find Venus naturally. It can also chase and follow the movement of Venus.

For shooting images, I used the CCD eyepiece from NexImage. By installing the device on the telescope, I can take pictures of stars by using a computer. A wireless connection between the computer and a telescope outside can be done.

I showed junior high students live video of stars through a large monitor inside the classroom. We can operate the telescope wireless in the classroom, then we can observe and follow Venus for a very long time.

I used the ∗motor focuser∗ to focus on Venus and we can do this by watching the monitor. I used a small and light telescope, the SE-120. It is easy to carry since it is light and battery functional.

The time to set up the telescope for schools to use is important. After you set up the telescope, find Venus, and transmit images to the monitor, one hour would have already passed.

Keywords: ScienseEducation, Venus, LiveStream

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GEJ020-03 Room:301A Time:May 22 09:30-09:45

Management of One-Day Geological Trip for Highschool Students More Than a Decade.

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During more than a decade, we have managed one day geological trip for 10th glade high school students as a part of geo-sciences classes. This report describes the details of our exercises. The field is located close to Sobura village in Kaizuka city, southern Osaka prefecture. Our students are divided into ten members groups, which are led by science teachers of our school.

The basic geology of this area has two main structures, a Mid-Cretaceous volcanic basement and overriding Late-Cretaceous sediments named ”Izumi group”. Therefore the students can study both igneous and sedimentary processes through the trip. Also they can examine sampling rocks and measuring strikes and dips in order to construct a geologic chart.

19 geological outcrops are located and they consist of unconformity, faults , joints, various sedimentary structures, key beds, a few fossils and interesting landscapes such as v-shaped valley or alluvial river terraces. In this area, the strata of the Izumi group are composed with the lowest base conglomerates, sandy conglomerates, thin acid tuff layers as a key bed and upper mud stones containing a few ammonites and bivalves indicating the Hetonai epoch,the latest Cretaceous.

Led by science teachers, the student groups can enjoy their trips by walk about 6-hours. A guiding manuals are employed for non-geology majored teachers.

Our school’s geological trip has been carried out for over 30 years, however some outcrop conditions are getting worse in recent years, and also the geological interpretation of a few outcrops are somewhat changed with modern stratigraphy.

In spite of the above mentioned problems, the trip area is rather compact and is quite suitable for students study as a whole.

Finally the students complete their reports with their unique characteristics.

Keywords: geological trip, Izumi group, unconformity, faults, fossils, high school

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GEJ020-04 Room:301A Time:May 22 09:45-10:00

Development of education program using geo-spatial information: A case study in Asama volcano

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This report includes an activity of super science high school project. We will report a new knowledge concerning education program using geo-spatial information. Teaching materials were made with digital elevation models and high-resolution satellite imagery.

Keywords: SSH, Geoscience education, Volcanic topography, Geo-spatial information

Japan Geoscience Union Meeting 2011
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GEJ020-05 Room:301A Time:May 22 10:00-10:15

The practice of a developing teaching programme by JpGU for earthquakes to lower secondary school students

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The committee of school curriculumme at Japan Geoscience Union (JpGU) has investigated into the school curriculumme of RIKA, which is roughly a subject of natural science, from primary schools to universities without the earth and planetary course at universities. According to our former studies (NEMOTO et. al., 2009; NEMOTO et. al., 2010), technical terms which appear in the present 5 types of RIKA's textbooks for lower secondary schools are different.

On the one hand, for instance, the words P wave, S wave, trench, earthquake, seismometer, principal motion, epicentre, hypocentre, seismic intensity, tsunami, plate, magnitude, the 1995 Kobe earthquake, and the 1993 Hokkaido Nansei-oki earthquake appear in all 5 textbooks. On the other hand, ridge, duration of preliminary tremor, seismic intensity meter, and uplift appear in 4 textbooks, oceanic plate, continental plate, fault, and subsidence appear in 3 textbooks. In the same way, Primary wave and Secondary wave in English, landslide or landslip, ground fissure, hypocentral distance, Japan trench, active fault, former seismic intensity scale, seismic intensity scale, and distribution of seismic intensity appear in 2 textbooks, and GPS, instrumental seismic intensity, burned-out house, completely or partial destroyed house, rock fracture experiment, island arc, landslide, earthquake generating car, earthquake country, news flash of earthquake, seismic energy, ground, seismic hazard, epicentral distance, 'SHINGENCHI' which is roughly in and around epicentre, hypocentre distribution, 'CHOKKAGATAZISIN' which is roughly speaking an earthquake directly above its epicentre, debris avalanche, disastrous earthquake, and disaster prevention day appear in only 1 textbooks.

That is to say, only one textbook describes the relationship between magnitude and seismic energy. Moreover, ground motion does not appear in any textbooks. Therefore, students may be liable to confuse the meanings of seismic intensity with magnitude.

At first, we accordingly examined what ratio of students, who belong to universities, understand the meanings of seismic intensity and magnitude. Secondly, we made new teaching curriculumme of earthquakes for lower secondary school students including with seismic intensity, magnitude, seismic energy, and strong motion. Thirdly, we practiced teaching the first grade students at RIKA classes in a lower secondary school using the proposed earthquake programme. The proposed key sentences are as below;

(1) The scale of earthquake is magnitude. Magnitude is related to seismic energy.

(2) The scale of ground motion is seismic intensity.

We used not only paper materials but also several simple experiments by a teacher and students at the practical classes. In one simple experiment, for instance, hard and soft jelly are used in order to understand the occurrence of different ground motion on hard and soft grounds into same input motion, respectively. For the purpose of measurement of the class effectiveness using the proposed programme, questionnaires were sent to the students.

As a result, using ground motion as part of at an earthquake education for the first grade students in lower secondary schools is effective in order to understand the meanings of seismic intensity and magnitude. In this presentation, we will report the results in detail and clarify remaining problems in order to farther developing the curriculumme in future.

The authors are grateful for a grant for KARATES Project (KAnagawa Researchers And/or TEchnicians to Schools Project) by KAST (Kanagawa Academy of Science and Technology), which is a tentative name, for providing a part of the financial support of this study. The authors would like to thank the first grade students of Hiratsuka municipal Kasugano Lower Secondary School and Hiratsuka Bosai Machizukuri no kai which is roughly the Group of Disaster Prevention in Hiratsuka City, Kanagawa prefecture.

Keywords: geosciences, earthquakes, lower secondary schools, experiment

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On the activity of the Educational Conference of Science and Mathematics Society in 2010.

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It reports on the activity of the academic society in 2010.
The main activity is two (School digital text book and National Center Test for University Admissions).

Keywords: Sciense education, Science and Mathematics Society, School digital text book, Education Ministry guidelines, National Center Test for University Admissions