

## The Experience Learning Program of Sakurajima Geopark

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Sakurajima-Kinkowan Geopark offers various kinds of experience learning programs. In 2013, we welcomed around 5000 students as a school trip. Digging hot spring, volcanic ash clay activity, and creating pizza and its kiln are the popular programs.

These are not just "simple activity" but we give them a twist as to "learn" about the volcano. In digging hot spring program, we explain about the lavas of three different eras and the difference of the vegetation on the lavas. After the explanation, the students experience the hot spring comes out from the sand near the sea shore. Within digging the sand 5cm in deep, the hot spring appears every places in the area, however the color and the temperatures are different depends on the points. We make the students to find the hottest hot spring and give a present to the champion team who found the hottest one. The reason why this program is popular is that it has the contents of both "finding" and "competing". However, there is a difficulty that it cannot be offered in the rain. We tend to go around the Sakurajima by bus and give the tour guide, however students get the bored with when they have plain explanation. Therefore, we are now developing the "escaping game" program that can be offered on the rainy day.

"Escaping game" is an experience-based event that participants gathering one room corporate with each other to escape from the room by figuring out the puzzle with using the clues. This is not only experience-based game but introduce the learning contents about Sakurajima-Kinkowan Geopark so that it will respond the needs of school trip.

We also develop the program named "rogaining" which is the field sports similar to orienteering. The rogaining is the game that group of 2 to 5 people go around the check points written on the map within a time limit and compete the total score. It has the contents similar to treasure hunting, so that the participants can go to the places where they rarely can visit and the minor regional resources.

Sakurajima-Kinkowan Geopark, offers the school trip program with learning and enjoyable contents to make them fulfilling activity programs. Please visit Sakurajima to learn and enjoy them.

Keywords: Sakurajima, Geopark, Experience Learning Program

## Enjoy time travel for 100 million years!! Proposal of educational travels at the Mikasa Geopark

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The Mikasa Geopark, admitted to the Japanese Geoparks Network in 2013, is located in Central Hokkaido, Japan.

The story of modern Mikasa begins with the discovery of "burning stone" coal in the Horonai district, southeastern part of Mikasa, in 1868. This discovery became an opportunity for forming the coalmine city, and supporting the industrialization of Japan. Moreover, the investigation of underground resources, including coal, also revealed that well-preserved ammonite fossils, that lived 100 million years ago, yielded abundantly.

Hence the Mikasa Geopark is a place where visitors can enjoy "Time travel for 100 million years", and know the evolutionary history of ancient life, and human history into which it developed with coal.

The Mikasa Geopark is now trying to attract educational travels for science education and social studies education. In the presentation, we introduce attribute of the Mikasa Geopark, and propose the educational travels in which students can learn and/or experience in the Mikasa Geopark.

Keywords: time travel for 100 million years, science education, social studies education, educational travel, Mikasa Geopark

## ”Outdoor learning text of Toya Caldera and Usu Volcano Global Geopark” which deepen the learning of the student

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Toya Caldera and Usu Volcano Global Geopark is the area that can learn easily ”the activity of the volcano”, ”Remains of the structure of the disaster”, and ”the history of humans living closely together with an volcano”. Therefore students more than 20,000 come as a learning trip every year and perform outdoor learning. And elementary schools, junior high schools and high schools of the whole country use this Geopark as materials of science and social studies and general learning. In addition, there are some guide groups in this area, and the school uses those guides, or teacher guides to own school. However, there were some problems until now. For example, the content of the guidance was different each time and it did not accept the request from a school enough.

So we made texts and learning programs for outdoor learning along the curriculum of the school. These contents are shown on Web site, and every school can use these free. Every school can choose the text depending on a purpose and use it free. In addition, we communicated these contents to the guide groups. And they will guide along these texts if the school request to use this text.

Now, there are three kinds of text ”Let’s feel a change of the earth at Mt. Usu (for elementary school)”, ”Let’s feel the wisdom of ancients that they got from Nature (for elementary school)”, and ”Let’s study plant succession of the forest at Mt. Usu (for junior high school and high school )”.Furthermore, we are planning making of the text” Let’s guess the activity of the volcano from changes of the ground at Mt. Usu”. Each text deepens learning by feeling it from observation of nature.

In this speech, we will introduce much learning contents written in these texts. And we will introduce how to use these texts and how to associate with guide groups. We wish every school come to Toya Caldera and Usu Volcano Global Geopark by school trip. And we wish these texts deepen the learning of every students.

Keywords: school trip, outdoor learning text, educational curriculum

## Utilization of Geopark for high school education - In case of San'in Kaigan Geopark -

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Recently, a practicing education program is necessary in a high school education. The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) proposed that it was important to cooperate with a research institute and university in a high school education by education guidelines. But a university and research institute doesn't have a special educational program for high school, and it is difficult to cooperate with a university and research institute for high school. The other hand, a school education is one of important programs in geopark activities. Geopark can offer various educational programs and act as an intermediary between high school and university.

In San'in Kaigan Geopark, we offer various educational programs by cooperating with a university and local research institutes. University of Hyogo cooperates with Toyooka high school in SSH from 2010. We utilized San'in Kaigan Geopark, Itoigawa Geopark, Muroto Geopark, Jeju Geopark and Lesvos Geopark for high school educations.

Keywords: geopark, high school education, Super Science High School, SSH, San'in Kaigan Geopark

## Experience the Excitement of Earth Sciences in the Itoigawa Geopark

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Since receiving Global Geopark Certification, the number of school trips to the Itoigawa Geopark has increased. In Itoigawa, school trips are centered on the Fossa Magna Museum (Earth Sciences) and the Chojagahara Archaeological Museum (History and Archaeology). Additionally, consultations are done with individual schools with regard to outdoor excursions, lectures, hands-on experiences, and other activities. Also, if the following study bases are expanded upon, school trip options can be offered even in rainy weather.

### 1. Study Bases

#### (1) The Fossa Magna Museum

An Earth Sciences Museum, it was totally renovated in March 2015 in order to better share the story told by the Itoigawa Geopark's land. Through a variety of exhibits including jade (science, hands-on experience, history, and legend), the Fossa Magna Theater, Dr. Edmund Naumann (the Father of Japanese Geology), stones, minerals, fossils, seismology and more, visitors can learn about the history of the Japanese Islands through resources found in Itoigawa. Video, hands-on exhibits, models, and more have been added to the museum. All panels and videos include English interpretation, allowing the museum to be enjoyed by an international audience. Exhibits are well-suited for study preparation or a concluding summary lesson. The museum also includes a lecture hall (80 seats), class room (80 seats), and a hands-on lab (40 seats), making it equally suited for lectures or hands-on learning. Small groups (5 ? 10) can also use the analytical electron microscope, polarizing microscope, petrographic saw, and other lab equipment. The museum also features the "Fossil Valley" outdoor limestone fossil-hunting exhibit where up to 60 visitors at a time can hunt for coral, sea lily, and similar fossils.

#### (2) Chojagahara Archaeological Museum (5 min walk from the Fossa Magna Museum)

Artifacts uncovered from the nearby Chojagahara Site (Middle Jomon Period, National Historical Landmark) are displayed at this museum. Chojagahara is the site of the world's oldest jade culture, and the museum features exhibits on the collection of jade stones from the coast and rivers, jadeworking, trade, seasonal food sources, pottery, dog?, and more. The Chojagahara Site, with reconstructed pit dwellings and dioramas, is only a five minute walk from the museum. The outdoor activity center beside the site seats up to 40 and can be used for fire-making, bead-crafting, and other hands-on activities.

### 2. Consultation

The above museums have 5 curators (3 Earth Science, 2 Archaeology). They are available for pre-visit consultation, guided tours and lectures, and hands-on activities. Certified Geopark Guides are also available to assist school trips. Contact the Fossa Magna Museum for more information about school trip consultation.

### 3. Itoigawa Area Access

Tokyo Station to Itoigawa Station (Hokuriku Shinkansen, 2 hours), Nerima IC to Itoigawa IC (Expressway, 4 hours), Itoigawa IC to Toyama IC (Expressway, 1 hour), Itoigawa IC to Nagano IC (Expressway, 1 hour), Itoigawa to Hakuba (National Route, 1 hour)

### 4. Public High School (Kanto Area Super Science High School) Example Course

Nagano-Itoigawa-Hokuriku Trip (1 day in Itoigawa). 9:30 a.m. Arrive at Fossa Magna Museum; 9:45-10:15 a.m. Lecture-"The Fossa Magna and the Japanese Islands" History of the Japanese Islands explained using field trip sites; 10:40-11:40 a.m. Fossa Magna Park, Inspection and sketching of the Itoigawa-Shizuoka Tectonic Line, study of connection with earthquakes, study of pillow lava and plate movement from sea to land; 12:00-12:45 p.m. Museum (Lunch and Break); 13:05-13:55 p.m. Seaside Stone Study, Stone Collection (Sedimentary, Volcanic, Metamorphic), Stone Labeling and Composition Study; 14:20-15:10 p.m. Fossil Hunting Coral, sea lily, etc. Students take home fossil collection case; 15:20-16:10 p.m. Museum Exhibit Tour (Review); 16:20 p.m. depart the Fossa Magna Museum

Keywords: Itoigawa Global geopark, School Excursion, Earth Science

## Learn the earth in the Izu Oshima Geopark.

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Izu Oshima is a volcano island, which stands in the Pacific Ocean 120km away from Tokyo. Because of the risk of ship cancel by high waves, there are not many schools, which visit us as a school excursion trip. But Izu Oshima Geopark has the various elements such as volcano, forests, sea, unique industries and lifestyles and the disaster prevention. We are sure that we are able to provide the attractive experiences according to the purpose of the visitors.

Izu Oshima Geopark can provide these following experiences

- 1 It is possible to feel the active volcano and the earth.
- 2 It is possible to consider about the relationship of volcano and waves, wind, rain through the previous points of views.
- 3 It is possible to feel the strength of plants which turn over new leaves every after the eruption.
- 4 It is possible to see the process from a seed to a forest only 30 minutes walk along single path in the mountain.
- 5 It is possible to confirm that all our lives are involved with the earth.
- 6 It is possible to consider the importance to live on the earth from the people on the island who try to learn the disaster prevention and to try to live with the volcano.

After the landslide disaster in 2013 we have storyteller guides about the disaster. We are sure that we can provide some kinds of sightseeing by which visitors can learn about the disaster prevention.

I will introduce some geo-resources of Izu Oshima Geopark based on some examples such as the field trips of SSH, super science high school, and some training camps of the biological club of high school.

Keywords: Geopark, Earth, Disaster prevention, Science, Volcano, Learning

001-07

Room:IC

Time:May 24 16:35-16:55

## Place that disasters, history and the blessing of an active volcano can realize - Unzen Volcanic Area Global Geopark

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Theme of Unzen Volcanic Area Global Geopark (Unzen Geopark hereafter) is "coexistence of an active volcano and human beings". Volcanic eruptions of Mt. Unzen have brought local inhabitants serious disasters repeatedly. However, the people continue living near the active volcano of Mt. Unzen and bring up original culture there. If you visit Unzen Geopark, you can learn why local inhabitants living in Shimabara Peninsula have stay near the active volcano through experiences. In this presentation, I introduce some education plans to learn a relation between active volcano and human beings in Unzen Geopark efficiently.

Keywords: Geopark, Unzen Volcano, Volcanic Disasters, Shimabara Rebellion, Educational Travel, House Accomodation

## Island experience introduction in Amakusa Islands

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The Amakusa Islands, consisting of about 120 islands are located in the southwest area of Kumamoto Prefecture: a beautiful archipelago with geologic and geographic characteristic landscapes and a 100 million year history, not to mention a treasure of ancient fossils offering its visitors a fantastic glimpse into times gone by. A unique culture has been carved out of life on these islands by its inhabitants adding to the many breath-taking sightseeing opportunities. Amakusa Geopark is to show off the diversity of geology, geography, history, culture, industry and ecology in Amakusa with a mind of ecologic conservation and economic growth. Purpose of the Amakusa Geopark are increase in the nonresident population, regional development for increase in the nonresident population, local patriotism, and the commercial activity in Amakusa area, based on good effect of Amakusa Goshoura Geopark activities. We promote the "Amakusa Geopark" for original geopark activity (Amakusa style) and keep the sustainable development in Amakusa area.

There are many important geologic aspects including valuable fossils of dinosaurs, mammals and mollusks in the Goshoura area. There are over 40 educational spots for finding fossils in the area, a fossil park, a show-house of ammonite and others with plates for explanation, not to mention various dinosaur remains. Sea taxi or rent yourself a bicycle takes you to these geosites and short trip programs giving for elementary, school students and tourists, which include taking fossils, learning a traditional fishing method called tontoko-ryo and a home-stay plan from 2001. The Goshoura area was selected as the 'top 100 geologic areas in Japan' in May 2006, Amakusa Goshoura geopark in October 2009 and "Amakusa Geopark" in August 2014.

The purpose of Geopark guide training program, through a lecture and the local training, is aimed for the guide of the local geology and creature of nature, culture and industry. We expect through this program aneffect guide authorization, common knowledge of the activity for local inhabitants and the interpreter for geopark which can convey resources in this area to anyone clearly. Geopark guide is important as a diffuser explaining "What is geopark" precisely and is necessary for an action united with local inhabitants or the education spread.

Keywords: Amakusa, experience, Goshoura



## How to Experience and Connect with the Land at Muroto Global Geopark

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Muroto Global Geopark is located on the Muroto Peninsular in the east of Kochi Prefecture. As the land here continues to be uplifted by earthquakes, even now the culture and history of its determined people vibrantly remains. Close to the coastline stand tall marine cliffs topped with flat, wide terrace plains. These marine terraces are symbolic geographical features of the land in Muroto. They were formed by glacial sea level change in the Pleistocene and uplift from earthquakes, causing them to rise around 2m every 1000 years. The terrace plains with the largest surface area were formed in the latest interglacial stage and at some points reach an elevation of 200m. They tell of the scale of uplift that has taken place in Muroto.

One of the features of the Muroto area is how the results of geological uplift have become a part of the peoples' lives. The terrace plains provide good drainage and abundant sunlight, and the people have made extensive use of them as farmland. Also, in the past Muroto prospered as a open sea fishing town, while presently the ports of Muroto are thriving from fresh seafood catches. These ports are known as excavated ports. Here you can see a unique view, where the seafloor of the ports is excavated, and the houses around the ports are around 7 to 8 meters above the water level. This is the result of continuous excavation required every time the land is uplifted by earthquakes. In this way, the people of Muroto have understood the nature of the changing land, and developed methods to live with it.

The greatest charm of the Muroto Global Geopark is without doubt the geotours guided by local residents. Stories from the formation of the land to the activity of the people are called forth by the words of the local guides. Presently there are three geotours on offer at the Muroto Global Geopark.

### <Cape Muroto Guided Tour>

At the tip of the Muroto Peninsula, jutting out into the Pacific Ocean, is Cape Muroto. A promenade stretches along its coastline. Here you get up-close and touch the geology of the Shimanto Belt Accretionary Complex, which provided the first on-land verification for the theory of plate tectonics. 365 days a year you can experience this on a guided tour as you walk through the cape's subtropical and coastal vegetation that is cultivated by the warmth of the Kuroshio current.

### <Mt. Dannotani Guided Tour>

At the Mt. Dannotani Site in the north of Muroto Global Geopark a number of giant cryptomeria grow wild, with trunks larger than 10m in circumference. The locals continue to care for the forest here and as well as cryptomeria, there are a number of other evergreen trees, along with wild deer and monkeys. On this tour, you can observe this ecosystem that flourishes upon land formed by an accretionary complex.

### <Kiragawa Township Guided Tour>

In the east of the geopark is the Kiragawa Township Site. This area has been recognized as an Important Preservation District for Groups of Traditional Buildings. Here you can see the form of a traditional Tosa Domain townscape. From the mid-19th century, the township prospered from the production of Tosa Binchotan charcoal. Now, wherever you look you can see examples of the wisdom of the people in the ways they protect themselves while living amongst the climate of Muroto, with its strong winds and rain.

There is much to witness and experience on these guided tours: the formation of the land at Cape Muroto, the prosperous ecosystem that lives upon it at Mt. Dannotani, and the harmony in which the people live with the land at the Kiragawa Township. The way of life of the people of Muroto is about accepting the changing land, utilizing it and living with it. Japan rests upon a mobile belt, and is prone to earthquakes and volcanoes. This way of life in Muroto might just be a signpost for how the Japanese people should live.

Keywords: Geopark, Muroto