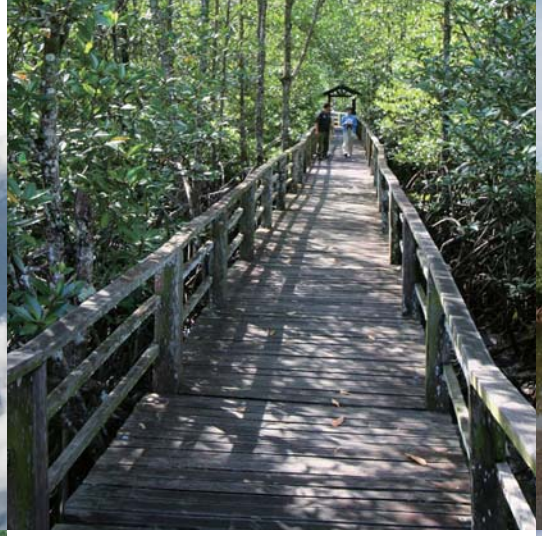



「大切なもの」

You are precious in My eyes

All of us have the opportunity to expand our horizons, thanks to our Lord. At Seishin, we aim to provide the best environment to support female students' advancement into scientific careers.




SEISHIN

SSH Guide 2008

Super Science High School

MEXT designates high schools that emphasize science, technology and math education as "Super Science High Schools" (SSHs). SSHs are undertaking research and development of innovative curriculums with emphasis on science, technology and mathematics study and effective ways of collaborating with universities and research institutes.

Notre Dame Seishin Gakuen
Seishin Girls' High School

Seishin Girls' High School SSH Study Support System

Knowledge Experience Study

*To improve basic scholastic ability *To put emphasis on English, Mathematics and Science

Life Science Course

Life Science Course

"Field practice"
Learning about nature through first hand experience in forests

"A study trip in Okinawa"
Learning about mangrove forests and coral reefs through first hand experience

" Life "
"Life" series lectures that discuss perspectives on academic fields

"Life Science : Basic"
"Practical English"
Acquiring knowledge through using personal computers, and strengthening English reading abilities

"Life Science : Practice"
Utilizing university facilities for learning technical skills

"Life Science Theme Study"
Investigations into evolutionary biology, biotechnology, chronobiology, and chemical fields

A study trip to Borneo
Cross-cultural communication
Environmental study

Humanities Course: Mathematics Major

Humanities Course Mathematics Major

Elective

"Advanced Subjects"
Selecting lectures from a 6-lecture series on topics such as volunteering and Chinese

Held simultaneously

"Mathematical Science Theme Study"
Investigations into the field of physics

Research Assignment

The aim of the "Life Science Course" is to create a model educational program for other girls' schools in order to support girls who wish to study the field of science and technology by entering related universities. This will allow girls to play an important role in a science and technology field in the future. The research at our school has four main themes which we promote especially for the "Life Science Course." We officially offer the information to the public as a model program for an all girls' high school.

1. To make up a new curriculum and educational program in order to support girls to play an important part in a science and technology field
2. To make up scientific viewpoints on "Life"
3. To make teaching materials and methods to encourage girls to actively study science and technology in order to be leaders in the field of science
4. To organize educational programs with universities and technical institutions

Siu-Shan (Suzanne) Mak
PhD., JSPS fellow 2007-09
Laboratory for Sensory Development,
RIKEN CENTRE FOR DEVELOPMENTAL BIOLOGY

Dear students in Seishin,

I gave you your first scientific lecture in English. I was particularly impressed by your curiosity throughout my lecture. Since curiosity is the fundamental motivation for doing experiments as a researcher, I am pleased to think that you have the potential to be scientists.

While you are studying in a super-science high school, I suppose that you are interested in acquiring scientific knowledge. Yet, it does not necessarily mean that you can be a good scientist in the future. It is not enough that you are only good at studying and following instructions from the teachers. To find out if you have the qualities to be a good scientist, here are some questions that you should ask yourself:

1. Are you self-motivated in your study?
2. Are you curious about what is going on and how things happen?
3. Can you think logically, independently and objectively?
4. Can you be honest and respectful to facts, no matter whether they are beneficial to or adverse against you?
5. Are you open-minded and full of imagination?
6. Do you have enough confidence in your thinking to openly discuss and if necessary, disagree with anyone regardless of his or her position?
7. Last but not least, are you good at learning from your failures?

If you already possess all of the qualities listed above, (Congratulations!) you will become a very good scientist. Fortunately, if you could answer 'yes' to only a few of the above questions, you can keep them in mind and train yourself to acquire these skills in the future. In any case, if you really want to be a good scientist, do not give up!

Best wishes,

Siu-Shan (Suzanne) Mak (PhD)

1st Grade

Special Subject Required by the School

Life Science Basic

1st and 2nd Grade

Life Science Practice

In the Life Science Basic Course, students learn how to use application software, digital cameras and other equipment. They also make presentations. In the Life Science Practical Course, students have the chance to use a laboratory room at a university. The 1st graders can take three practical lessons with the biotechnology faculty at Fukuyama University. The 2nd graders can take a practical lesson about molecular biology with the science faculty of Okayama University of Science. In addition, the 1st graders can take some lectures related to the assignment study, which will enable them to decide the theme of their study for the next year.

A practical lesson in biotechnology at Fukuyama University

1st-3rd Grade

Special Subject Required by the School

Practical English

We cannot learn a language without reading books. In this course, students can have a chance to read a lot of books using vocabulary and grammatical structures they have learned before at school. Extensive reading is a way of reading to grasp the general outline without analyzing each sentence. We provide students with more than 1200 books of varied levels. We hope they can learn to read English theses in the future by enjoying reading books of their own level at their own pace.

An advanced English class

2nd Grade Elective

Special Subject Required by the School

Advanced Subjects

In the Humanities Course, students can learn from a variety of subjects in the curriculum. The Advanced Subjects Course consists of ①Volunteer activities ②Chinese lessons ③English lessons supported by Notre Dame Seishin Univ. ④"Women and Children in Present Society" supported by Notre Dame Seishin Univ. ⑤High Level English ⑥ "Useful Management" supported by Kawasaki Univ. of Medical Welfare. Students can choose one class from these subjects.

Listening exercises at Notre Dame Seishin University

2nd Grade

Special Subject Required by the School

Life

In this course, students are required at first to acknowledge the various ways of thinking and finally they are supposed to reconsider themselves and how they should live. The course consists of four parts; interesting lectures given by professionals, self-analysis through group discussion and psychological tests, surveying activities, and writing reports.

Attending a psychology lecture

Listening to a presentation by a sculptor

1st Grade

Field practice

Students begin the course by learning about local forests at the Field Science Center of Tottori Univ. First, they memorize popular plants. Then, using some tools, they find out the age and the height of trees. Finally, they have a practical work experience in the forests. Last year they examined planted forests, estimated the amount of CO_2 the trees can absorb and presented the results both at an academic conference and at Saba Univ. of Malaysia.

Researching trees in the forest

2nd Grade

A study trip on Iriomote Island, Okinawa

The aim of this trip is to expose the students to a natural environment and think about it seriously. Using Iriomote Island as a training ground, they are given lectures by researchers on the Iriomote wildcat, the fruit bat and have direct contact with nature.We conduct a field observation of mangrove forests and coral reefs.

Attacus atlas ryukyuensis

The Hinai River

2nd Grade | Special Subject Required by the School

Life Science Theme Study

Four groups of students are working on their own theme study. ①The green chemistry group aims to cause a chemical reaction that would reduce the burden on the environment by finding the best conditions of esterification through the use of an ionic liquid as solvent. ②The bioengineering group aims to find out the relationship between the types of flowers and types of yeast by collecting "flower yeast" (wild yeast) living in flowers and fruits. ③ The developmental biology group aims to establish a method of artificial fertilization and to find out a suitable condition for breeding the hatched larva by using salamanders designated as an endangered species. ④The chronobiology group is examining variables that influence the flowering time and are also examining whether the biological clock directly causes flowering.

Making agar medium

Protecting salamander breeding areas

Explaining their studies during the poster presentation

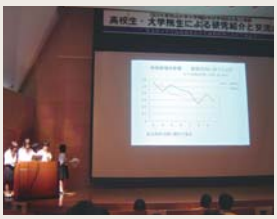
2nd Grade | Special Subject Required by the School | Elective

Mathematical Science Theme Study

We are now studying about the various characteristics of magnets, especially,how the magnetic force arranges the magnets according to how strong or weak they are. The ordinary magnets we see every day have the small magnetic domains in them. A selected material can be magnetized by placing these small magnets in a certain pattern on the material. The pattern will determine whether or not the material becomes magnetized. The patterns can be observed by using the magnetic compasses. Dr.Yoichiro Nambu, who received the Nobel Prize in Physics this year, used this phenomenon to explain the mechanism of spontaneous symmetry breaking. The magnet is no longer a magnet if its temperature becomes higher. This is because the small magnets in the magnet fluctuate randomly due to the thermal agitation. The small magnets in the magnet continue to point in any direction at random, even if its temperature becomes lower. The magnet is no longer a magnet at the lower temperature, too. However, it becomes a magnet once again if it is put into a strong magnetic field, because the small magnets in the magnet arrange to point in the same direction, parallel to the magnetic field. We conducted experiments to prove the natural magnetic phenomenon by using magnetic compasses. We hypothesized that the length of the spread of the small magnets is almost as big as the magnetic field. Based on this hypothesis,we are continuing our experiments. In addition, we are making our own software to examine our data.

An Experiment of Preferred Magnetic Orientation

Computer Simulation Using the Software of Our Own Making



Oral Presentation at Okayama University

1st and 2nd Grade | Applicant

A study trip to Borneo

In March of 2006, we proposed to Saba Univ. of Malaysia our plan to offer students practical studies, mainly about the "natural environment", which would stimulate teenagers' interest. With help from the research institute for protecting tropical organisms, we managed to realize this plan. During the trip, our students were given some biology classes in English concerning the diversity of animals and plants. Also, they presented their theme study about "The Estimation of the Amount of CO_2 Absorbed by the Trees in a Certain Area of Forests" and formed a positive relationship with students of a local high school. In addition they observed mangrove forests, saw colorful fish in the blue sea, took a river cruse to locate wild animals, and watched orangutans being taken care of at Orangutan Rehabilitation Center. These experiences are a priceless addition to their classroom studies.

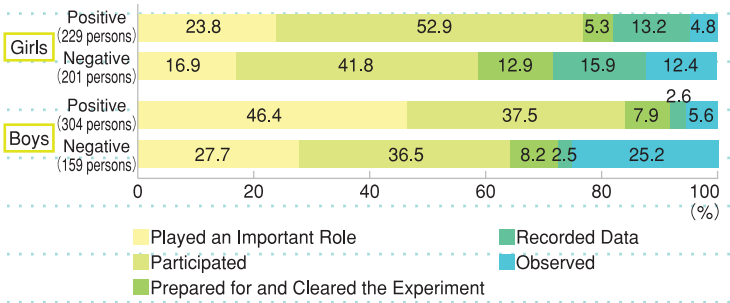
Aqurium at Saba University

Attending a lecture at Saba University

Searching for Proboscis Monkeys on a river cruise

—Some Distinctive Data about Science and Math fields—

DATA 1 Likes and Dislikes of Science and the Roles of Experiments among Elementary School Students



DATA 2 Likes and Dislikes of Science and the Reasons for Learning Science

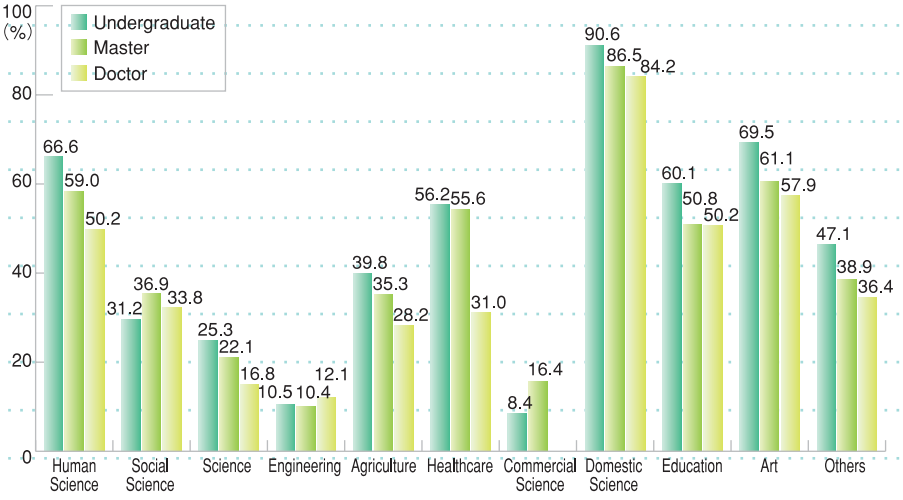
	Girls		Boys	
	Positive (227 persons)	Negative (200 persons)	Positive (303 persons)	Negative (152 persons)
Find the Wonder of Nature	82.8	46	74.3	46.1
Know the System of Natural Phenomena	67	47	62.7	42
For Entrance Examinations	52.4	59.5	62	64.5
For Everyday Life	35.7	21.5	33.3	18.4
For Future Family Life	36.6	13.5	32.3	13.2
For Future Occupation	29.5	11.5	38.6	18.4
It is Useless	3.5	17.5	4.3	22.4

(%)

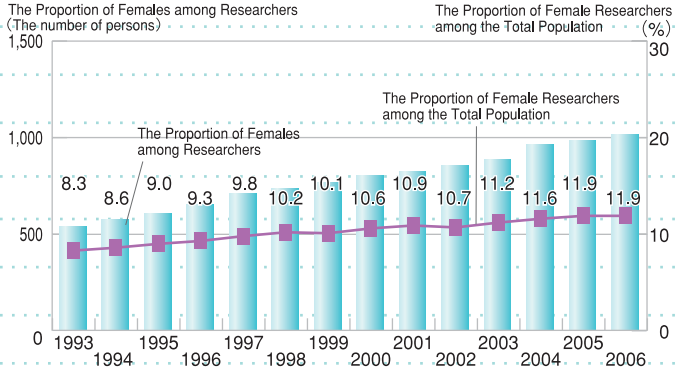
DATA① DATA 1 shows that boys and girls who dislike science tend not to play an important role in experiments. Only about 30% of the boys and 20% of girls who dislike science answered "I played an important role in the experiment."

DATA② The boys and girls who like science reportedly want to "find the wonder of nature" and to "know the system of natural phenomena." Boys and girls who have negative attitudes to science seem to focus only on entrance examinations.

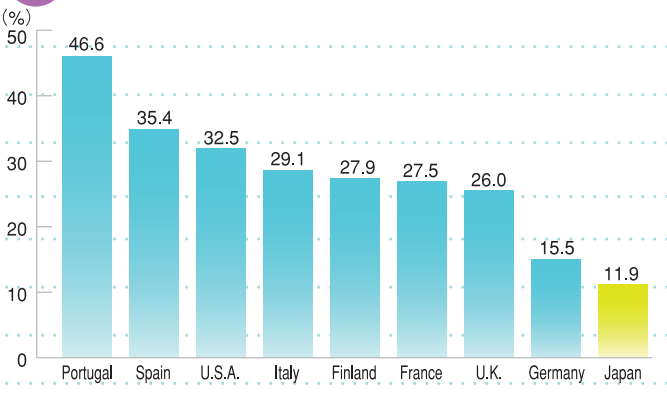
DATA 3 The Percentage of Females among Undergraduate and Postgraduate Students



DATA 4 The Transition of the Number and the Percentage of Female Researchers

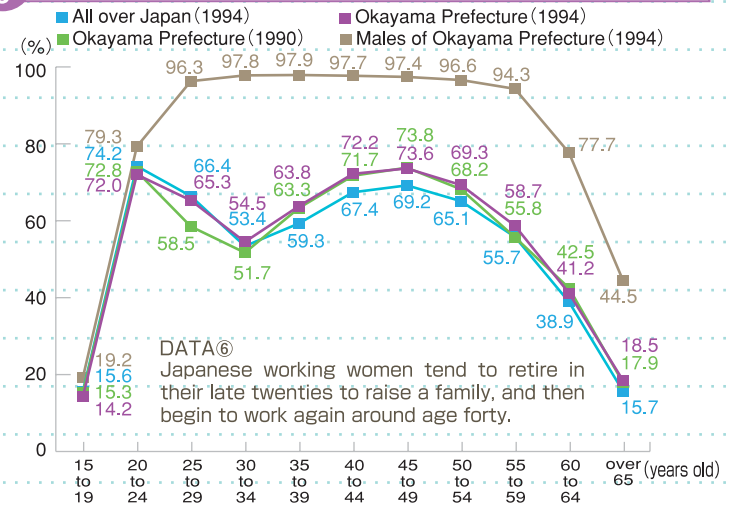


DATA 5 The Proportion of Females among Researchers



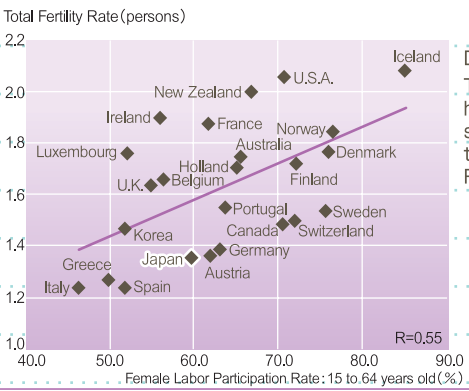
DATA③④⑤ The percentage of females among Japanese researchers is increasing, but was still 11.9% in 2006. The percentage of female researchers is expected to increase in the future.

DATA 6 Labor Participation Ratio of Females



DATA⑥ Japanese working women tend to retire in their late twenties to raise a family, and then begin to work again around age forty.

DATA 7 Total Fertility Rate and Female Labor Participation Rate (15 to 64 years old) in the 24 Member Countries of OECD : In the year 2000



DATA⑦ The more females have advanced into society, the higher their Total Fertility Rate is.

THE SOURCE
● DATA1／理科離れしてるのは誰か(松村泰子編)日本評論社2004● DATA2／理科離れしてるのは誰か(松村泰子編)日本評論社2004● DATA3／平成18年度学校基本調査(速報)● DATA4／科学技術研究調査報告(総務省統計局)● DATA5／平成17年版男女共同参画白書(内閣府)科学技術研究調査報告(総務省統計局)● DATA6／ジェンダーって？(岡山県男女共同参画推進センター)● DATA7／少子化と男女共同参画に関する社会環境の国際比較報告書(内閣府男女共同参画局)国立印刷局

A message from a member of the SSH Governing Council

Shin-ichiro Nishimatsu
Department of Molecular and Developmental Biology, Kawasaki Medical School

A letter from the human genome

No one is perfect; everyone has good points and bad points. Look on the bright side and be positive! Your disadvantage becomes your advantage; your weaknesses give you strength and beauty. Such positive force seems to have assisted in human evolution. Recent studies of the human genome have shown us the possibilities. A member of the gene encoded myosin heavy chain, MYH16, is specifically expressed in the jaw muscles of humans and monkeys. All non-human primate MYH16 genes are perfect and are encoded with a complete protein. In contrast, the human gene is altered and the protein is incompletely coded. The mutation caused a decrease in the jaw-muscle size, and remodeled the human cranium to allow an increase in the size of the brain. The human genome has hidden levels of regulatory complexity and variability that have begun to reveal themselves since the initial sequence became available in 2001. We have been gaining a greater understanding of how genome differences relate to human evolution and disease. Life is more dynamic than you imagine.

Members of Seishin Girls' High School SSH Governing Council

Kenji Tomioka Graduate School of Natural Science and Technology, Okayama University
Takushi Hatano Department of Life science and Biotechnology, Fukuyama University
Satoshi Hirayama Department of Early Childhood Education and Care, Kurashiki City College
Izumi Irie Faculty of Education, Okayama University
Shigeshi Kikunaga Faculty of Human Life Sciences, Notre Dame Seishin University
Yoshiki Masuda Department of Biology, Kawasaki Medical School
Shin-ichiro Nishimatsu Department of Molecular and Developmental Biology, Kawasaki Medical School
Junji Sano Tottori University Forests, Field Science Center Faculty of Agriculture, Tottori University
Kazue Tazaki Graduate School of Natural Science and Technology, Kanazawa University
Kunio Yasue Research Institute for Informatics and Science, Notre Dame Seishin University

A member of the Governing Council presenting his study before students

Won the JST Executive President Award

"The Research Presentation Meeting for SSH Students in 2008" was held by MEXT and JST at Pacifico Yokohama on August 7 and 8.

This meeting was aimed to promote SSH project and to spread its activities by raising students' interest in scientific technology.

On the first day, students from 31 high schools made up 6 groups. They gave their presentations and the representative from each group was chosen. On the second day, the six representative schools gave their presentations again to about 2000 people in a large public hall. Our school won the JST Executive President Award.

Giving a presentation in the public hall

Explaining their studies during the poster presentation

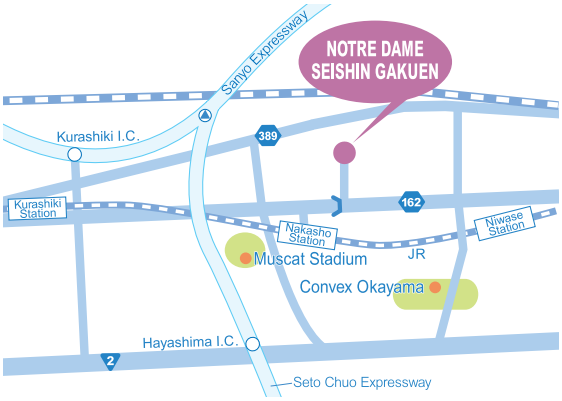
Receiving the award

Presentation about reproduction of salamanders

Info & map

Homepage
www.nd-seishin.ac.jp

For further information, please visit our website. Our school activities are posted there. In addition, please visit our blogs to read more about these special programs: "Our Principal's Diary", "SSH", "Biology Room", and "NELP".



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