

E ducation for G lobal G irls S cientists



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 students' advancement into scientific careers.



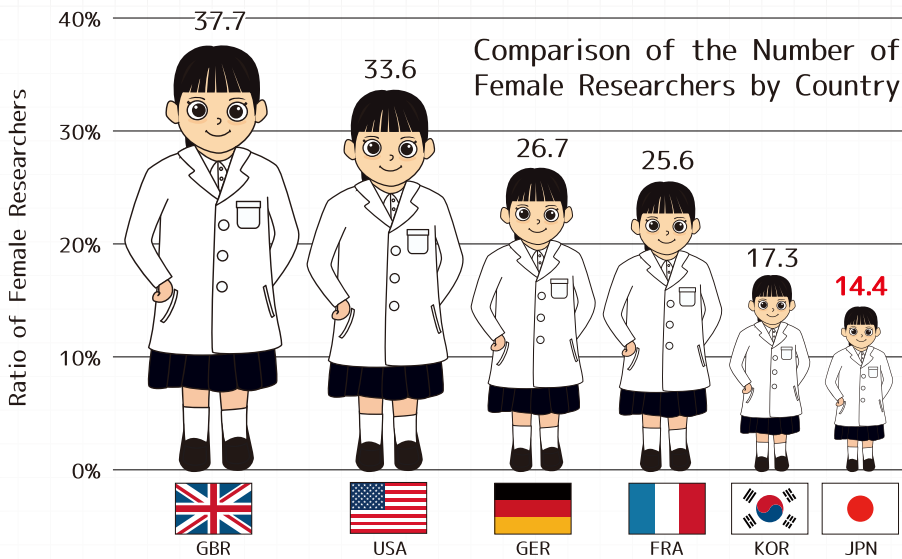
Seishin Junior High School
Seishin Girls' High School

Notre Dame Seishin Gakuen

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 in these areas while collaborating with universities and research institutes.

To you, the budding woman scientist



Source: MEXT

The number of female researchers continues to be considerably low in developed countries. This is a significant problem.

As a Super Science High School, we have been promoting the advancement of scientific fields since 2006. Through global society and ESD (Education for Sustainable Development) have become important science education. With these in mind, we wish to contribute to students' sciences, looking to act on a global scale and build the next generation.

Notre Dame Seishin Gakuen Junior High

Junior High School

School Campus Nature Survey (1st grade)

Life Sciences Junior Lab (3rd grade)

Community Forest Production Activities (1st~2nd grade)

Australia Study Excursion (3rd grade)

Life Sciences Junior Lab (3rd grade)

Raise various plants in accordance with the seasons.

Apr.

May

Jun.

Jul.

Aug.

Sep.

High School

School Campus Nature Survey (1st grade)

Introduction to Life Sciences (1st Grade: Life Science Course)

Life Science Lab (1st Grade: Life Science Course)

Life Science Lab (1st Grade: Life Science Course)

Improve skills needed for doing research projects.

Green Science (2nd Grade: Life Science Course)

Perform experiments, labs, fieldwork and take lectures

School Biotope Management (1st~3rd Grade: voluntary applicants)

Maintain the biotope during cleaning time and after-school hours.

UTHM Malaysia Study Excursion (1st~2nd Grade: voluntary applicants)

Connecting with female researchers (1st~2nd Grade: Life Science Course)

Foreign teacher-led homeroom (1st Grade: Life Science Course)

Use homeroom time as a way to increase exposure to English.

English for Life Sciences (1st~3rd Grade: Life Science Course)

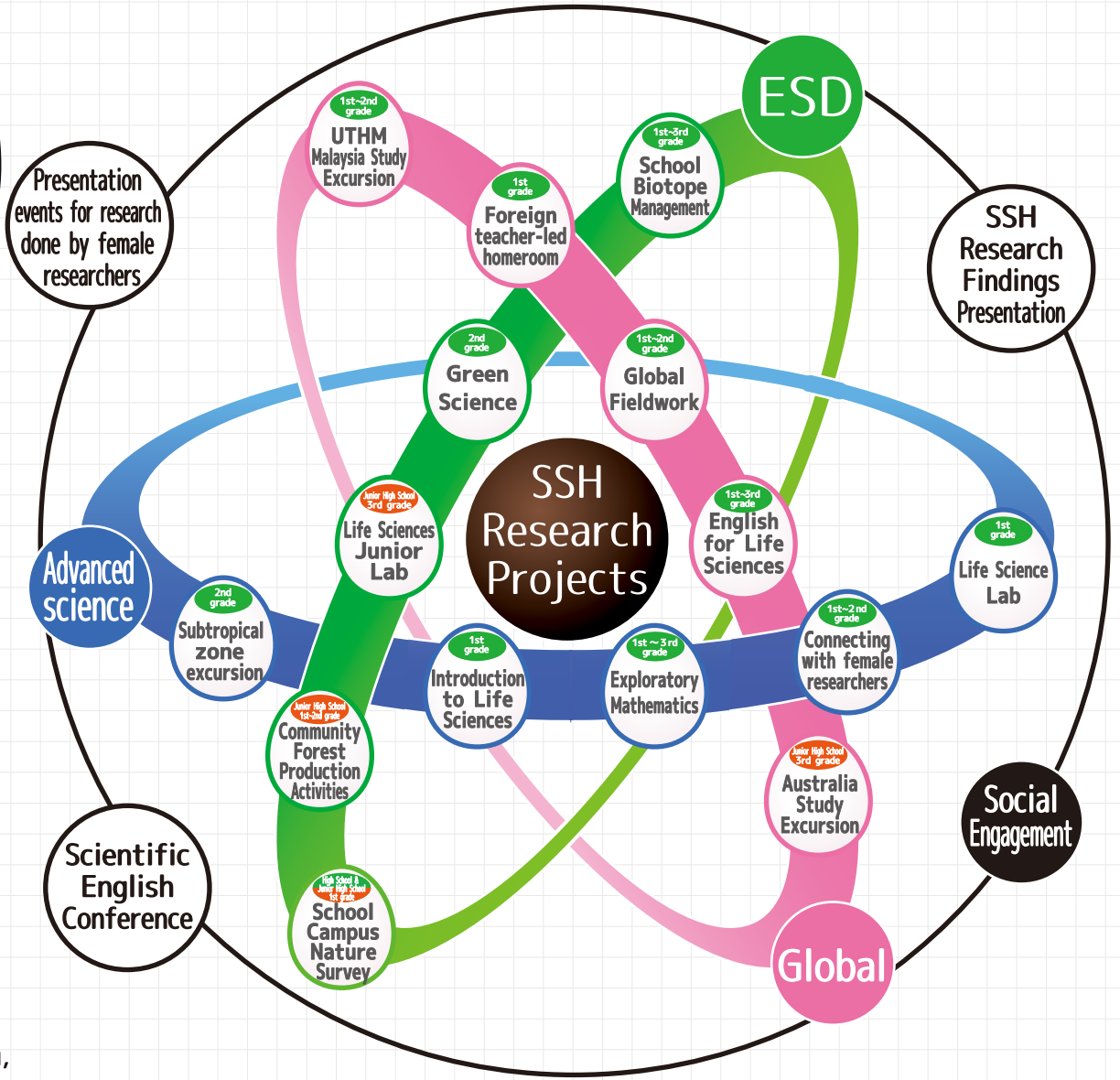
Enhance English proficiency by learning about scientific

Exploratory Mathematics (1st~3rd Grade)

Carry out a more exploratory style

Scientific English Conference

SSH Research Projects (2nd Grade: Life Science Course)



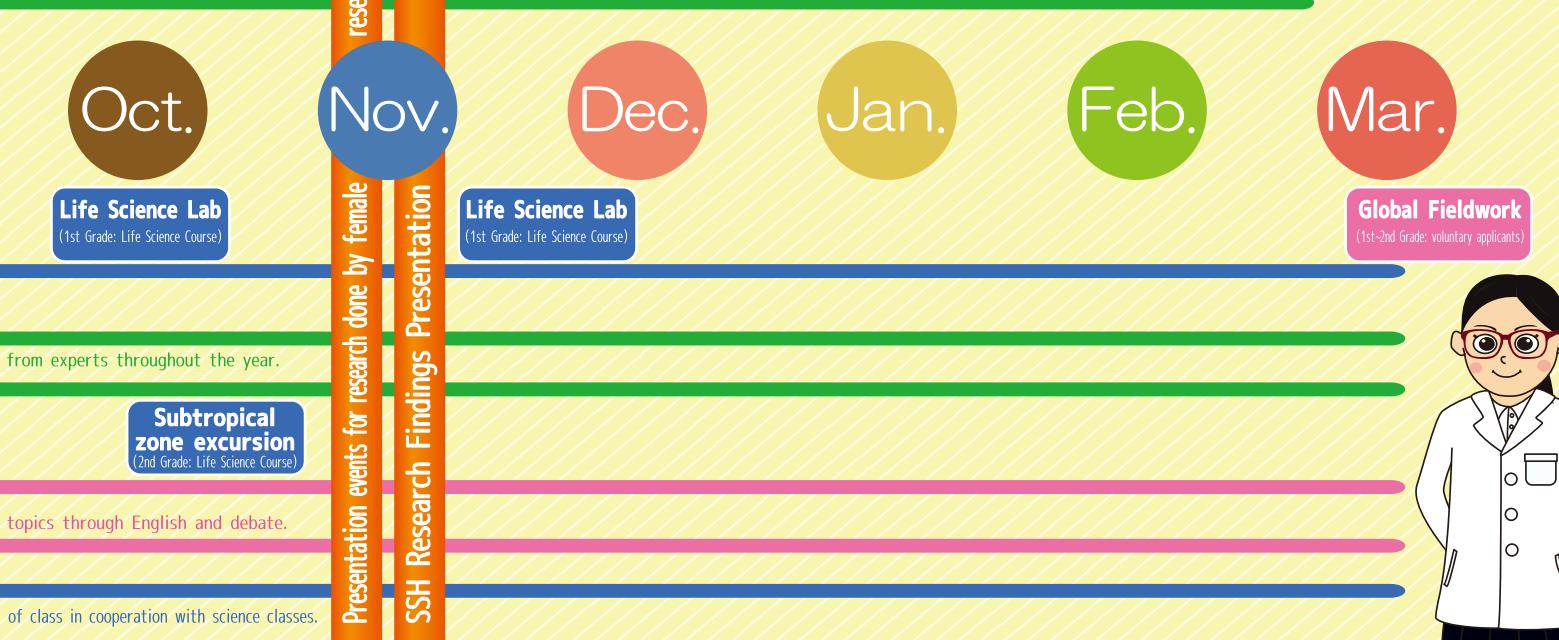
Seishin Junior High School Seishin Girls' High School Science Career Selection Support System

School Seishin Girls' High School
Fukuto Tanaka (SSH Program Chair)

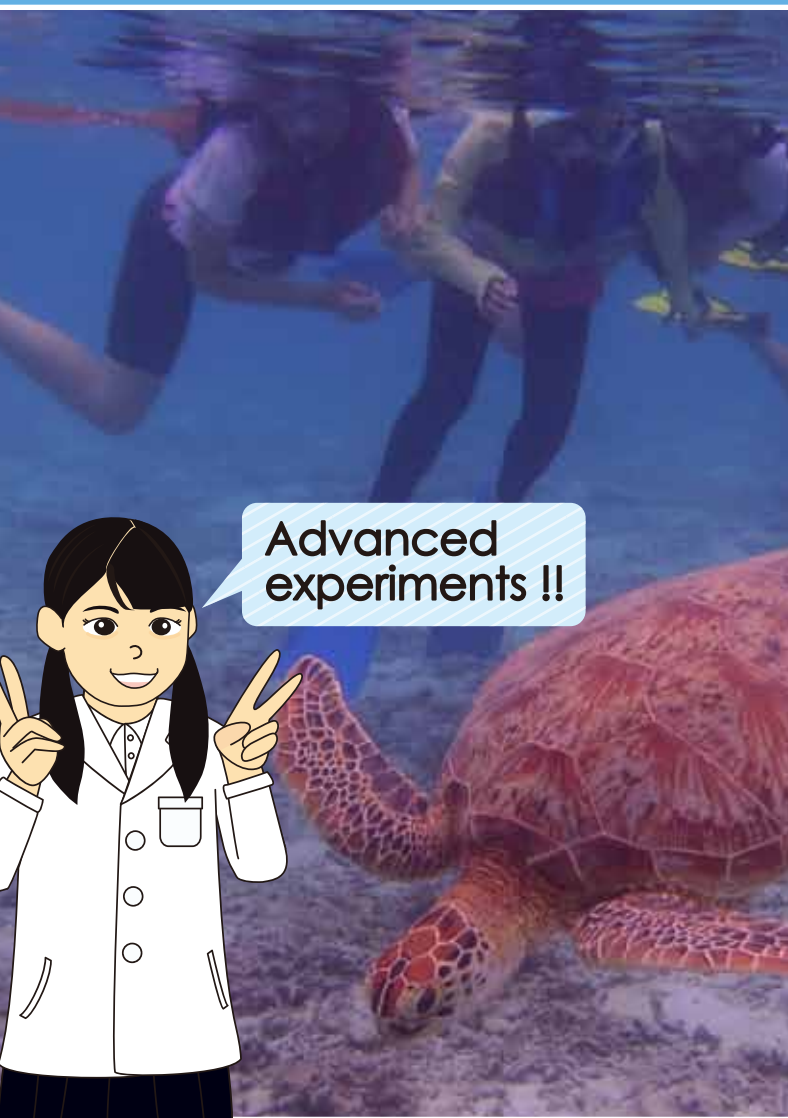
High School (3rd grade)

Annual Research Development Schedule

In order to develop basics in English, mathematics, and science, we have created a class timetable which emphasizes class time in these subjects.



2nd Grade: Humanities Course (voluntary applicants)



Advanced experiments !!



Experience Advanced Science

In addition to the basic curriculum of junior and senior high school, we offer a range of content developed in coordination with universities and research institutes. The expertise of instructors heightens students' curiosity for science and their future education and career plans. Lectures, labs, camps, and fieldwork — all designed to deeply interest our students.

1st grade
Introduction to Life Sciences
 This class develops skills needed for students' second year research project, such as using computers for data processing and creating presentations. Also, lecturers from universities and speakers from the private and public sector give science-themed lectures which demonstrate the application of science in a range of fields.

1st grade
Life Science Lab
 By stepping onto a university campus and engaging in university-level experiments, students get a better picture of the kind of work conducted at universities. These programs are done in cooperation with Hiroshima University and other universities.

1st ~ 3rd grade
Exploratory Mathematics
 By linking mathematics and science together, we aim to deepen student understanding in these subjects while developing their autonomy. Within each unit, students take on an exploratory learning activity and participate in other activities that differ from a traditional math class.

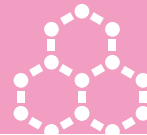
2nd grade
Subtropical zone excursion
 This is an overnight fieldwork excursion done in Okinawa prefecture. Students learn about nature from different perspectives and deepen their scientific understanding of nature in this new, unfamiliar setting. This program is done in cooperation with the University of the Ryukyus and Okinawa Institute of Science and Technology Graduate University.

1st ~ 2nd grade
Connecting with female researchers
 In cooperation with Osaka Prefectural University, students have access to lab facilities and lectures given by women researchers at the university. Also, students are given an opportunity to meet and interact with female graduate students. This experience allows them to create a clearer image of going on to university in a science field. This is one unique aspect of our school's educational approach.

Topic Zamami Island Nature Expedition
 Kerama Islands National Park on Zamami Island is one of the destinations of the subtropical zone excursion. On the remote Kerama Islands, students can interact with various forms of sea life.



Valuable experience !!



Broaden Your Global Horizons

In order to act on the global stage it is important to know the cultures, languages, climates, geographies, and living things of many countries.

1st-3rd grade
English for Life Sciences

Learning science content through English and debate helps our students to gain practical English skills for the sciences. Moreover, through presenting their own research in English, students gain the experience and skills useful for presenting at international conferences in the future.

Topic SSH Scientific English Conference



In this conference we hold an open class of our "English for Life Sciences" class. This open class focuses on debating issues of policy and ethics in the conservation of endangered animals. Many teachers from around the country come to participate every year.



1st-2nd grade
Global Fieldwork

This is our environmental and international-themed excursion abroad. In cooperation with Universiti Malaysia Saba (UMS) and Universiti Tun Hussein Onn Malaysia (UTHM), students take lectures and perform labs in English. Many activities happen in the abundant nature of Malaysia, including mangrove forest observation and planting, hiking on Mt. Kinabalu, snorkeling at Sapi Island, and more.

1st-2nd grade
UTHM Malaysia Study Excursion

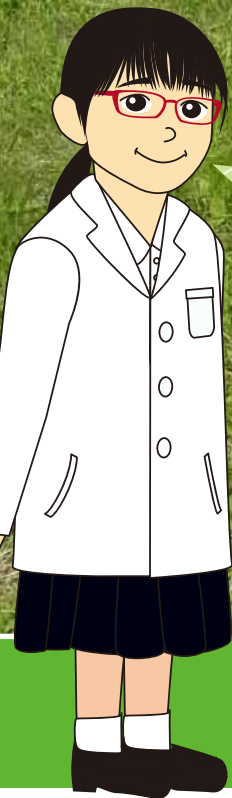
In cooperation with UTHM, students take lectures on advanced biology and fieldwork. In doing so, students learn the importance of using Malaysia's natural resources and biodiversity sustainably. Furthermore, students participate in discussions and presentations about what they have learned.

1st grade
Foreign teacher-led homeroom

Having a native English speaker lead the homeroom increases the opportunities for students to use English. Beginning with basics such as daily routines we help students become more familiar with English.

Juni High School 3rd grade
Australia Study Excursion

Students participate in a two-week long homestay in Australia to help improve their English communication skills. Students deepen their intercultural understanding by accepting their new surroundings and acting according to the local way of life there. Students take classes in English and have many opportunities to experience the nature, animals, and celestial bodies they would not be able to experience in Japan.



Thinking and doing !!



Creating a Sustainable Future

In order to cherish the gifts from the past and the things we will leave for the future, we must work to solve the issues that people face all across the globe. This requires informed action and consideration of different viewpoints. Active learning is used to teach students to evaluate their daily habits and move towards acting independently.

2nd grade
Green Science

Through expert lectures, workshops, and field surveys, students gain a deep understanding of sustainable development. With this understanding, students take on a project they can independently carry out. Looking at environmental problems that are close to home but global in scale helps students consider various perspectives.

Junior High School 3rd grade
Life Sciences Junior Lab

Students visit the Okayama Nature Conservation Center two times a year — once in the spring and once in the fall. Under supervision of the lead researcher at the center, students collect small animals from surrounding paddy fields and observe plant life on the center grounds during the spring visit. In the fall, students survey invasive species. During these two visits, students experience the connections between nature, plant life, and animal life.

1st-3rd grade
School Biotope Management

Managing the biotope helps students deepen their understanding of the local ecosystem. Students come to know the changes the seasons bring as the plants and animals living in the biotope change with them. We also cultivate water clover used for experimentation inside the biotope.

Junior High School 1st-2nd grade
Community Forest Production Activities

Student awareness of sustainable development is raised by carrying out production activities using geographical features of our school grounds. Through the cultivation of plant foodstuffs, students deepen their understanding about food and living things. Activities are planned according to the season, including mushroom, rice, and blackberry cultivation.

Topic Okinawa Summer School



We offer a research trip to learn about the global environment through activities on Zamami and Kume Islands. While doing surveys with local junior high and high school students, students learn about the preservation of rare species, the impact of introduced species, and were able to make new connections with each other. On Zamami Island, we were able to catch the introduced species - the Mississippi red-eared slider.



High School 1st-2nd grade
School Campus Nature Survey

During science classes, students carry out nature observations on our school grounds to understand the surrounding ecosystems. This is done while paying attention to content from textbooks in order to help students better retain what they are learning in class.



~ Our Research Project ~

Dealing with global warming means we must reduce the amount of greenhouse gases in the atmosphere. In order to do this, it is critical that we preserve forest ecosystems, which absorb carbon dioxide. For ten years, we have carried out forest surveys as part of our SSH activities in cooperation with Tottori University. In these surveys, we measure and record tree species, tree height, tree diameter, and calculate the tree age of all trees within the survey area and from this data, we calculate the carbon absorption ability of the forest area. Finally, we compare the carbon absorption abilities of different kinds of forests. We have found that natural forests with varied tree heights and diversity of tree species have a higher carbon absorption ability than artificial forests which have been created for commercial purposes.



Fig. 1 Carrying out one of the forest surveys

We surveyed temperate forests in Okayama prefecture and subtropical forests in Okinawa prefecture.



Preservation of Natural Forests for Combatting Global Warming

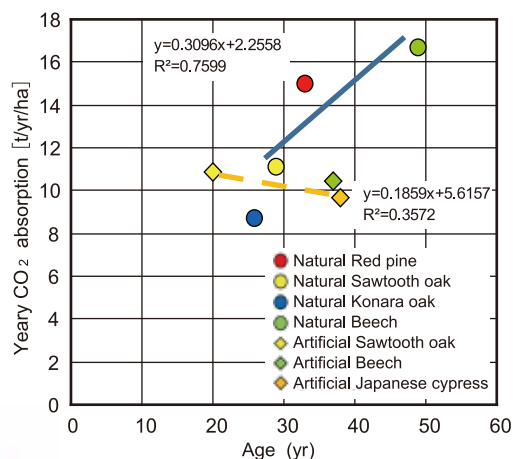


Fig.2 Relation between age and carbon sink

As natural forests move through the transitional stage, there is a trend for their carbon dioxide absorption ability to increase, but artificial forests do not appear to have the same trend.

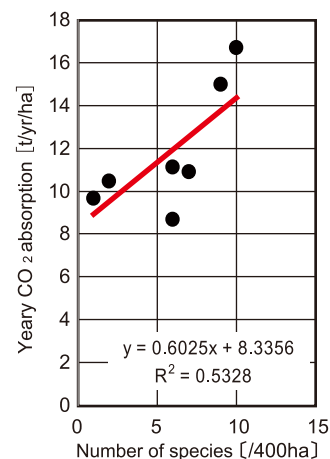


Fig.3 Relation between number of species and carbon sinks annually

Figure 3 shows that as tree species diversity increases, there is a trend for carbon dioxide absorption ability to increase as well.

SSH Research Projects



Life Science Related Research Projects

2nd Grade: Life Science Course

Projects are offered in the following groups: developmental biology, bioengineering, chronobiology, plant physiology, fungi studies, environmental science etc. Salamanders, newts, turtles, water clover, and oyster mushrooms are just some examples of the organisms we use in our projects. In chemistry research projects, students study oscillating reactions – chemical reactions that repeat changes within relatively short time periods.

Research themes tend to focus on environmental sciences and through these research projects students think about sustainable development and how to spread this thinking in society. Students continue their research under the guidance of professors from Okayama University, Yamaguchi University, Tottori University and more. Finally, students present their results at various academic conferences and in doing so, they improve their presentation skills.

Topic International Science Conferences

Our students were chosen as representatives of Japan to participate in Intel ISEF 2016 held in the United States, where they presented their research. Also our students presented their research at the 8th World Congress of Herpetology, which was held in China.



Mathematics Related Research Projects

2nd Grade: Humanities Course voluntary applicants

Students research the properties of materials, especially magnetism. Students collect data by repeating trials using materials that they themselves have created for the experiments. This year students have been focused on the way in which temperature may affect the propensity of a material to become more magnetic. There are opportunities to perform experiments in cooperation with Okayama University.



Material Science Related Research Projects

2nd Grade: Humanities Course voluntary applicants

Students do research on antioxidants using everyday foods and cosmetics. High level research is done in cooperation with Notre Dame Seishin University and Okayama University. Students have a chance to polish their presentation skills during a seminar where they present their results. Students also complete research papers which explain their experiments and results.

Junior High School Research Projects

In science class, students participate in a shared research project with their class. Volunteers have the opportunity to pursue the project in greater depth after school. Students start research from their own simple questions and they receive the necessary guidance to produce quality research and quality presentations.





A Message from the SSH Steering Committee



Seishin Girls Super Science High School has always been committed to uplifting women's education by integrating global education and cross-cultural exchange. Students are exposed to international endeavours in the field of science, in particular biology and sustainability. This is fulfilled by linking Seishin Girls Super Science High School to universities in Malaysia such as Universiti Tun Hussein Onn Malaysia and Universiti Malaysia Sabah since 2006. With this, students of Seishin Girls Super Science High School are growing aware of what is happening not only in Japan but also around the world, which will prepare them to become better women in the future.

Alona Cuevau Linatoc -Malaysia Universiti Tun Hussein Onn Malaysia Associate Professor-



Presentation Events for Research Done by Female Researchers ~ Come Together! Forum for Young Women Scientists ~



The 'Come Together! Forum for Young Women Scientists' is an annual event which has been held by our school since 2009. This day is full of motivating activities such as a presentations given by students and researchers followed by lectures from leading scientists. In order to accommodate presenters from all over the country, we hold this forum in a easily-accessible location.



Female researcher presenting her work.



Female high school students presenting their research.



Lecture given by a female researcher.



Our Homepage

Our homepage offers a blog detailing our SSH and global education-related activities. Please check our blog to learn more about our programs.



「SSH」 <http://www.nd-seishin.ac.jp/ssh/>



「Global Education」 <http://www.nd-seishin.ac.jp/native/>



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