



Report of JAXA Space Education Center

On Its Activities in 2011–2012



Japan Aerospace Exploration Agency



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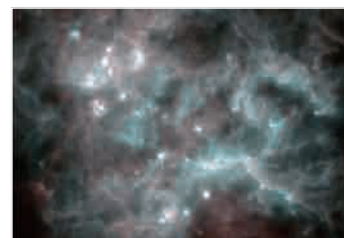
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I. INTRODUCTION

As the Space Education Center of Japan Aerospace Exploration Agency (JAXA) enters its seventh year of operation following its establishment in May 2005, it continues to enhance its activities both in terms of quantity and quality to ignite children’s curiosity toward nature, life and the universe and to inspire them to achieve higher goals. Recognizing “space” as the unique source of interest, imagination and inspiration, the Center has continued to demonstrate the effective use of space subjects, materials and resources at schools in local communities and at home to stimulate children’s interest in not only science and technology but also various human conducts and their surrounding environment.

A growing number of individuals, groups and organizations within and outside Japan are now sharing the Center’s goals and principles in carrying out space education activities, resulting in the increased partnerships and strategic alliances with various entities to reach out to more young people. The time between the year 2011 and the year 2012 could be marked as the period of strategic expansion of space education efforts based on the systematic support provided by the Center to all stakeholders.

This report reflects the major developments in the activities of the Space Education Center and its achievements in up to March 2012 and indicates directions to be pursued in the coming year.



II. BASIC FACTS

A. Establishment of the Center

The Space Education Center was established on 1 May 2005 by an executive decision by the President of the Japan Aerospace Exploration Agency (JAXA). The Center formally opened on 19 May 2005 at JAXA Sagamihara Campus.

JAXA, as well as its predecessors before its establishment in October 2003,¹ had carried out educational activities as part of the public relations and outreach activities. Those activities focused on increasing public awareness, understanding the work of JAXA and highlighting societal benefits of space activities, with the aim to gain public support for the activities of JAXA.

The recognition of the fundamental difference between public outreach and education resulted in the establishment of a separate group dedicated to space education activities. Originally located within the Public Affairs Department, the space education group carried out activities using attractive space materials to stimulate young people's interest in science and other subjects relevant to their daily lives and ultimately to have positive impact on their growing-up process. This group served as the predecessor to the Space Education Center and, to some extent, laid the foundation for the work of the Center.

B. Goals and principles

Space subjects, resources and materials inherently have a unique power to attract young people's attention, to encourage them to take on challenges and aim for higher goals. While the Space Education Center considers it important to attract young people to pursue career options in space-related areas, so as to expand the pool of future space scientists and engineers, the key mission of the Center is to effectively use space materials to have a positive impact on the minds of young people in their development process, helping them to expand their potential and to become socially responsible individuals.



Opening of the Space Education Center: Prof. Y. Matogawa, First Director of the Center (left), and JAXA President K. Tachikawa (right)



JAXA Sagamihara campus



¹ JAXA was established by merging the following three separate space-related entities: National Space Development Agency (NASDA), Institute of Space and Astronautical Science (ISAS) and National Aeronautics Laboratory (NAL).

There are a few principles that the Space Education Center follows in its activities.

The Center considers it important that the young people understand the thinking process behind what they acquire as knowledge. Taking advantage of their simple curiosity toward nature, life and environment that surrounds them, the Center offers them with opportunities to experience the joy of discovering something new and previously unknown to them and solving mysteries by themselves. In this process, the Center also aims to increase young people's appreciation of science and technology and to enhance their capacity for logical thinking.

"Preciousness of life" continues to be the most important message to be conveyed to young people through all activities of the Center.

The abundance of goods and services that meet various needs of people in Japan might indicate the richness of the society. However, that may not necessarily be true if one pays close attention to the minds of people, especially the young ones. An alarming number of young people in Japan have been observed to have limited motivation to do anything, to be pessimistic about their own future and even to treat people's lives lightly, including their own lives, which subsequently gets them involved in serious crimes. The people involved in the establishment of the Space Education Center had become deeply concerned about those young people and wanted to do something about it.

Space subjects and materials were found to offer an excellent tool to inspire and motivate young people, to start gaining self-confidence and aiming for higher goals in their lives. It was observed that after learning that there had been a lengthy chain of relays of one life to another before a certain life was born and that the lives on the Earth today had come a long way from pieces of galaxies and stars, many of the young people started to think deeply about the origin and evolution of lives and gained appreciation of the importance of life.

The Center aims to increase their appreciation of all forms of lives on the Earth by having young people learn about the origin and evolution of the universe and life and showing how long we have been searching for Earth-



like planets without success.

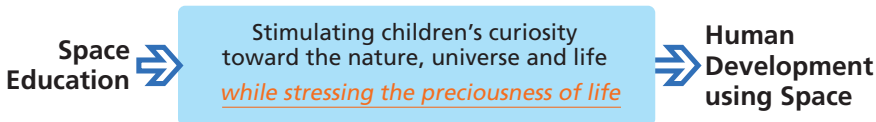
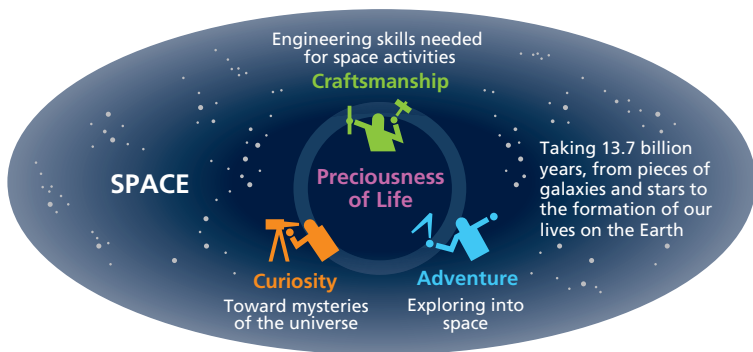
The spirit to “Never Give Up” is another important message always emphasized in the activities of the Center, as this spirit is considered essential for anybody who wants to achieve something significant in this challenging world. The history of space exploration is full of examples that show how important this is.

Through its activities, the Center also guides young people to understand how important and how rewarding it is to be part of the society to build a better future together. No individual can carry out space activities by themselves, but together, a large number of people with various backgrounds can even build global systems that could benefit large populations around the world. The Center aims to increase young people’s appreciation of the power of collective efforts toward common goals.

With the above goals and principles, the Center carries out its activities to help young people become full of curiosity, adventurous spirit and craftsmanship, always aiming for the best at whatever they do.



SPACE = Unique source of interest, imagination & inspiration.



C. Organizational structure and major activities

The Space Education Center consists of the Space Education Office, which serves as the implementing body of the Center, and a group of experts who administratively belong to other offices and departments but have been appointed as technical advisers to assist in the planning and execution of the Center’s activities. As of February 2012, the Space Education Office consists of 18 staff members, including 8 regular staff and 10 invited or contracted staff.

The Center carries out the following four major activities:

- 1) formal education support, to assist teachers and schools in carrying out classroom activities using space materials;
- 2) informal education support, to assist local communities in organizing educational events for young people on non-school days to learn about space-related subjects and to participate in hands-on activities;
- 3) home education support, to assist parents in enhancing communication and interaction with their children at home through joint hands-on activities using space-related materials and resources;
- 4) international activities, to promote and support space education activities outside Japan through collaborations with other countries and international organizations.



Formal education support



Informal education support

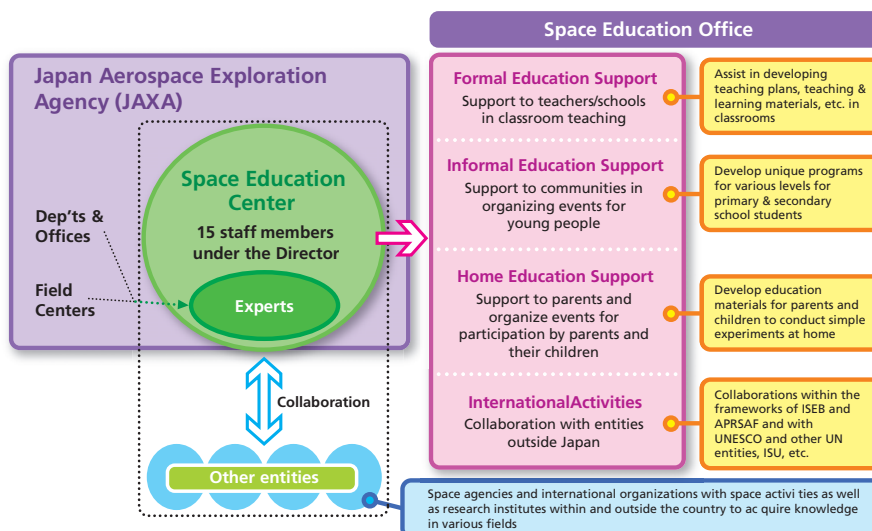


Home education support



International activities: Space Education Seminar in Nepal

MAJOR ACTIVITIES



D. Collaborations with other offices and departments within JAXA

Other offices and departments of JAXA also carry out activities that have educational elements. The Space Education Center collaborates with those offices and departments.

For example, the Center works in cooperation with the planning and outreach group of the Public Affairs Department. This Department is responsible for sending JAXA staff as lecturers to give talks on a range of space-related topics on various occasions upon request.

The Space Education Center also works in cooperation with the Space Environment Utilization Center, which carries out education-related activities in association with Space Shuttle flights and the use of the International Space Station (ISS). The Space Education Center has recently announced the opportunities for schools to participate in the “Seeds in Space” project. This project allows the participating schools to compare the growing process of those seeds that have been flown on the International Space Station with normal seeds on the Earth by using seeds of the flowering plant named “Miyakogusa”, or Japanese lotus corniculatus, and “Asagao”, or morning glories.

Resulting from the collaborations with the Human Space Systems and Utilization Mission Directory of JAXA, the Space Education Center continues to provide opportunities for teachers of kindergartens, primary and secondary schools in Japan to participate in the annual Space Exploration Educators Conference (SEEC), held at Space Center Houston, in Houston, United States of America. The Conference offers opportunities for teachers to learn about and exchange information and experiences on using space materials to teach across the curricula, not only for science, but also for language, arts, mathematics, history and other subjects. As a new approach, JAXA provided the Japanese teachers with the opportunity to perform a lecture at a local school in Houston at SEEC2011.

The Satellite Applications and Promotion Center produces useful information materials with images taken by JAXA-operated satellites for distribution to the public. The Space Education Center works in



Call for opportunities to participate in the “Seeds in Space” project



Astronaut T. Doi and samples used for an educational experiment relating to space and life



SEEC session with teaching demonstrations by Japanese teachers supported by the Space Education Center

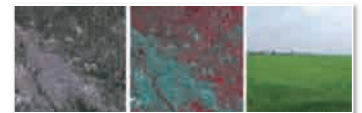


Bamboo battery experiment demonstrated by a Japanese teacher at Seabrook Intermediate School on the occasion of SEEC

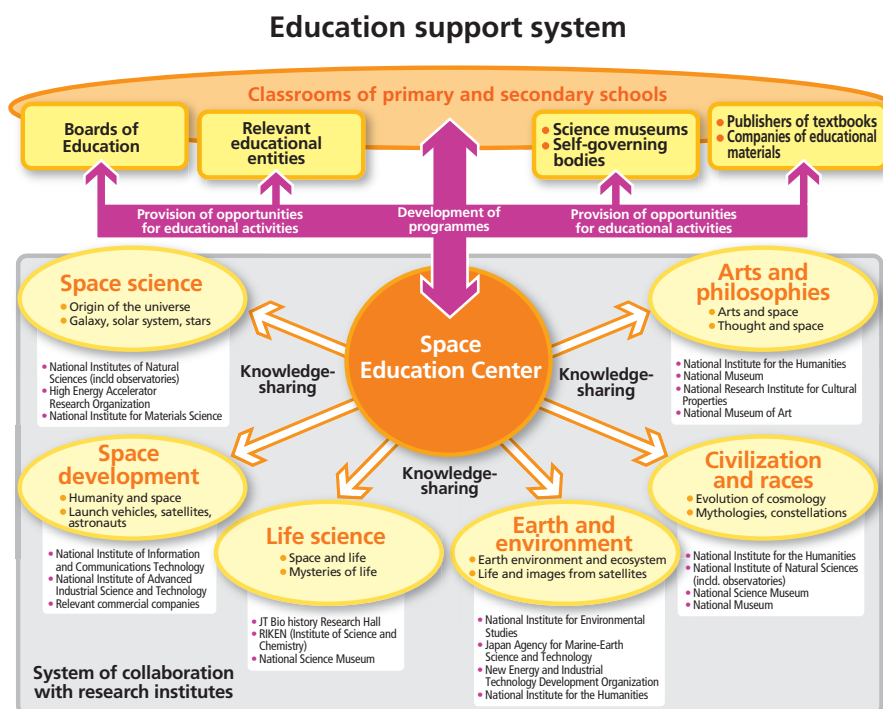
collaboration with the Satellite Applications and Promotion Center to carry out educational activities that use images taken by JAXA satellites.

The Space Education Center seeks for collaborations with various entities outside JAXA that are engaged in education. Close collaborations with teachers and schools are considered most essential. The Center has continued to explore opportunities for collaborations with associations of teachers, boards of education boards as well as publishers of textbooks and companies of educational materials, in its efforts to better integrate space subjects and materials into the existing curricula for formal education and to produce education materials that better meet the needs of schools and teachers. Significant progress has been made in this area particularly in the past year. Details of collaborations with those entities are provided in Chapter VI of this report.

The Center takes a comprehensive approach in pursuing collaborations to expand space education activities. The Center seeks for collaborations not only with those entities that have direct links with space activities by being involved in space science and technology, life science and Earth science, but also with others that are engaged in studies on humanities, civilization, arts and philosophy.



Supporting senior high school class in learning about the local environment in collaboration with Satellite Applications and Promotion Center



A. Support for Formal Education

Space activities encompass the accumulation of human knowledge and provide a common thread that links many different aspects of human activities. Many materials that resulted from space activities catch the attention of young people and appeal to their curiosity. The challenge is to find the best way to make those materials available under the most conducive learning environment for young people.

Through its formal education support, the Space Education Center aims to expand and enhance the use of attractive space materials by schools and teachers to assist the students in learning various subjects according to the curriculum guidelines. The Center considers it essential to work closely with school teachers as they are in a better position to understand young people's needs and feelings through their daily interactions.

There are a several strategies pursued by the Center to achieve that goal.

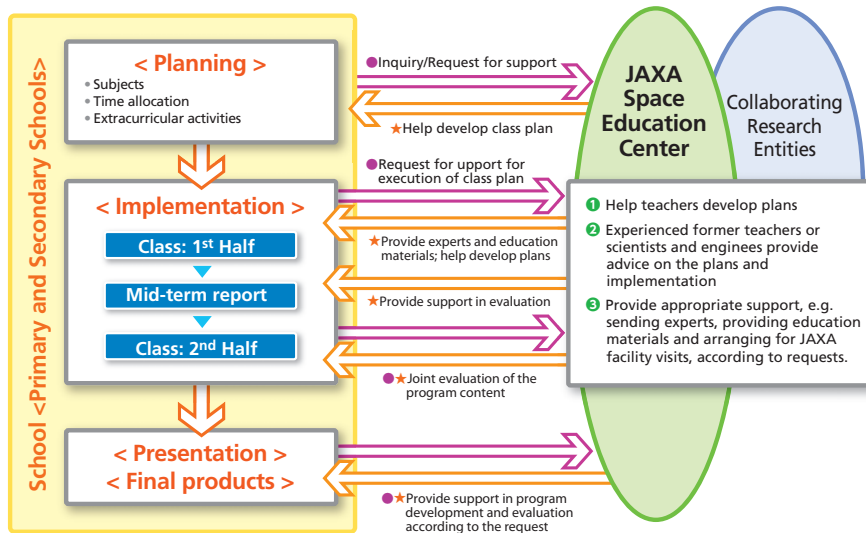
One is to provide customized support to the teachers who have contacted the Center with a request for support. After the initial contact, the Center's staff hold numerous consultations with those teachers to articulate their needs and interests, identify goals and develop plans for activities for their classes. Once the plan has been developed with the teacher, the Center identifies appropriate experts of JAXA from a range of space science and technology fields as well as experienced educators and pedagogy experts and calls upon them to provide knowledge and expertise to develop teaching and learning materials. When the teacher carries out classroom activities according to the plan, the Center sends its staff and appropriate experts to provide on-site support to the teacher. Upon request by the teacher, the Center assists the teacher in evaluating the results of the activities. Depending on the interest and request by the teacher or the school, the Center also assists in establishing partnerships with other schools or promoting collaborations with relevant entities in the local community.

Through this entire process of support (see the chart for "School Support: Process" below), the Center ensures that initiatives come from the teacher, and not the Center.



SCHOOL SUPPORT: PROCESS

TEACHERS IN THE DRIVING SEAT. JAXA to assist the teachers



The Center's support is not limited to science classes. It covers a wide range of disciplinary fields taught at school, including social science, Japanese language and the arts. The Center's support covers various types of classroom activities depending on the needs of and objectives pursued by the teachers. Such activities cover normal classes according to the curricula guidelines, integrated learning classes as well as extracurricular activities. Since the expansion of its support to include kindergartens from 2007, the Center has been supporting an increasing number of kindergartens, elementary schools, junior high and senior high schools, as well as faculties of education of universities.

The Center has strengthened its efforts to establish collaborations with boards of education in the local communities to jointly provide training opportunities for teachers to learn about space education and to acquire skills to bring space into classrooms. This has been done in order to ensure that the efforts made by those teachers and schools that have received support from the Center to expand space education activities would not be isolated and that their efforts would be supported by the supervisory bodies overseeing the school management and activities.

Such training opportunities are also provided to potential candidates for teachers who are studying in the faculties of education at universities. The



Supporting the class for environmental education, Kudan Junior High School, Chiyoda, Tokyo



Supporting the Japanese language class Junior High School attached to Nagasaki University

Center pursues collaborations with faculties of education as it is considered more desirable that the school teachers already know about the benefits of space education and have basic skills to conduct classroom activities using space materials before they become too busy to meet regular teaching requirements and to deal with administrative work required at their schools.

In light of the recently revised curriculum guidelines issued by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in March 2008 for all levels from kindergarten to senior high school, the Center has been strengthening its efforts to help teachers to adjust the teaching contents and focus as well as methods to follow the revised guidelines by using relevant space materials.

With the idea to foster “the strength to live”, the revised guidelines aim to help the students develop independent minds to identify issues, analyze, think, judge and take appropriate actions while caring about and collaborating with others. In terms of substantive content, the revised guidelines have expanded the subjects relating to science and mathematics. It presents an excellent opportunity to introduce its space education materials for a wider use by school teachers for the Center.

The revised guidelines were instituted to coincide with the principles of the Center, which has developed a number of teaching materials, methods and programmes through its support to teachers and schools in the past years particularly for science classes.

While some parts relating to mathematics and science have already been implemented at schools from April 2009, the revised curriculum guidelines are planned to be implemented in entirety for the elementary schools from 2011 and for the junior high schools in 2012. Textbook companies have begun to produce new textbooks and their supplementary learning materials that follow the revised guidelines. This presents a good opportunity for the Center to introduce space subjects and materials into classroom teaching in a systematic manner. The Center has been actively offering its support to textbook companies and those companies producing supplementary learning materials to use, for example, images taken by JAXA satellites and spacecraft or photographs of space activities of JAXA.



Space food produced by students of Obama Fisheris High School, Obama, Fukui



Teachers training course



Collaborating with the Faculty of Education, Nagasaki University to train future teachers

1. Establishing Strategic Footholds

As part of the executive directions set by the management of JAXA, the Space Education Center has been tasked since the fiscal year 2008 to establish strategic footholds in all nine regional blocs of Japan, i.e. Hokkaido, Tohoku, Kanto, Hokuriku and Shinetsu, Tokai, Kinki, Chugoku, Shikoku, Kyushu and Okinawa, by March 2012. This is to ensure that the kind of classroom support provided by the Center continues to be expanded and further enhanced in an effective manner to benefit each of the primary and secondary schools without requiring direct and intense support by the Center itself. While it does not need to be a school, and it could well be a science museum or a board of education in the local community, a strategic foothold should endorse the goals and principles of the Center and should actively pursue the development of space education materials and teaching methods to be introduced to schools within the block under its responsibility. The Center was also tasked to ensure the steady increase in the number of schools that newly introduce aerospace subjects into their classroom teaching by using the materials or teaching methods developed by the strategic foothold in their bloc.

As of March 2012, the Center has concluded agreements with twenty entities to serve as its strategic footholds in Hokkaido, Tohoku, Kanto, Hokuriku and Shinetsu, Tokai, Kinki, Chugoku, Kyushu and Okinawa blocs.

List of strategic footholds (as of March 2012)

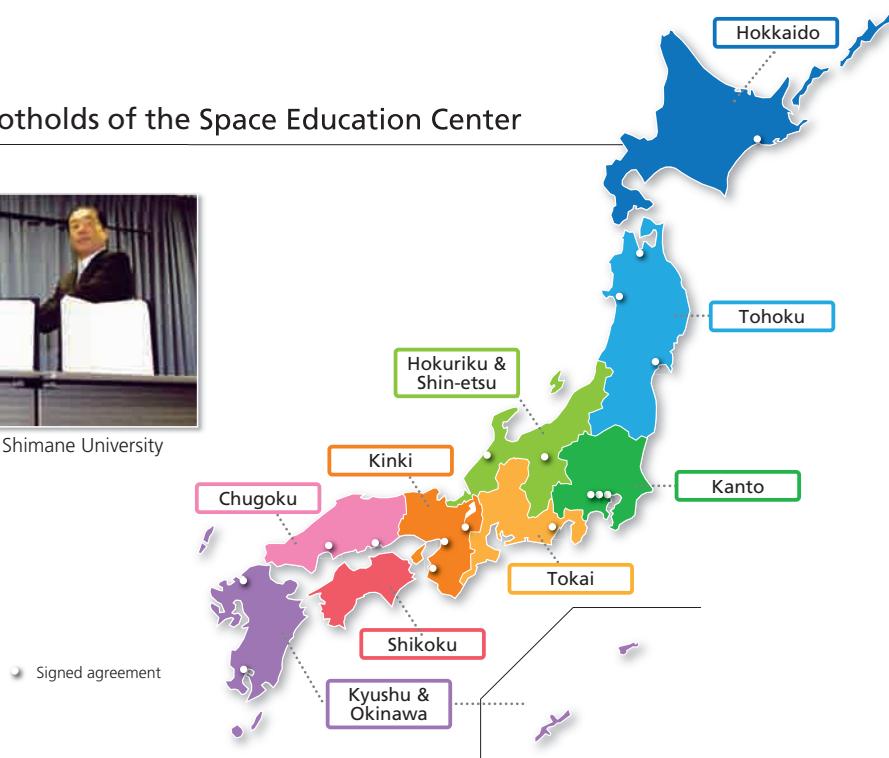
Bloc	Area	Entity	Date of Signature
Tohoku	Akita	Akita University	21-Mar-08
Tohoku	Miyagi	Miyagi technical College/Sendai Technical College	19-Sep-08
Chugoku	Shimane	Shimane University	27-Oct-08
Hokkaido	Kushiro	NPO Kodomo Yugakukan Shimin Stage ¹	2-Dec-08
Hokuriku/Shinetsu	Shimosuwa	Shimosuwa-Town - Board of Education	2-Dec-08
Kanto	Tokyo	Waseda University	29-May-09
Tohoku	Aomori	Aomori-City Junior High Schools Working Group on Science	1-Aug-09
Hokuriku/Shinetsu	Komatsu	Komatsu-City - Board of Education	1-Dec-09
Kyusyu/Okinawa	Kagoshima	Kagoshima-City	10-Jan-10
Kyusyu/Okinawa	Fukuoka	Kyusyu University	8-Mar-10
Kanto	Tokyo	Tokyo-Gakugei University	10-Mar-10
Kanto	Tokyo	Kokubunji-City - Board of Education	1-Apr-10
Tokai	Shizuoka	Shizuoka Science Museum - RU·KU·RU	12-Jun-10
Chugoku	Kurashiki	Kurashiki-City Board of Education	1-Jul-10
Chugoku	Kure	Kure-City Yamato Museum	18-Aug-10
Kinki	Wakayama	Wakayama-Prefecture Board of Education	15-Nov-10
Kinki	Osaka	Osaka-Prefectural Education Center	20-Dec-10
Tokai	Gifu	Ogaki-City Board of Education	24-Mar-11
Kanto	Tokyo	Keio University	24-Mar-11
Shikoku	Tokushima	Anan-City Board of Education	25-Jan-12

¹ Kodomo = Children, Yugakukan = Study House, Shimin = Civic/Citizen

Strategic Footholds of the Space Education Center



Agreement with Shimane University



B. Support for Informal Education

Supporting informal education continues to be another pillar of the activities of the Space Education Center. Using unique programmes and materials that it has developed, the Center supports educational activities carried out by other entities rather than schools outside the formal curricula, normally during non-school days.

Through its informal education support, the Center aims to maximize the synergies of space education efforts undertaken by various entities, including local governments and relevant non-governmental and non-profit entities. The Center aims to achieve this objective while ensuring that its goals and principles continue to be followed by those entities involved in space education activities around the country and building upon what has been achieved by its “Cosmic College”.

In the past year, the Center has followed a few strategies as described below.

Based on its belief that the responsibilities of fostering local children lie with the local communities, the Center encouraged more local communities to take the lead in organizing space education events for local children while the Center itself plays only a supportive and advisory role. This is to allow for the massive expansion of space education activities to reach out to all parts of Japan without increasing the level of resource requirements of the Center. By ensuring that the local communities are involved from the beginning of the planning, the Center has made efforts to increase the sense of ownership and responsibilities among the local communities organizing those events.

The Center has increased its efforts to establish partnerships with interested industries to organize space education activities. Ways and means to establish partnerships have varied depending on the interest of the industries and the circumstances of the activities concerned.

The Center’s efforts have shifted from the planning, organization and management of events to the enhancement of its support system for space education instructors and leaders, who play key roles in space education events organized around the country. In addition to providing training



opportunities and technical advice, the Center has begun to provide material support to those instructors and leaders who are active in carrying out space education activities.

C. Support for Education at Home

As natural evolution of its support for informal education through collaborations with local communities, the Space Education Center has increased its efforts to bring space home in the past year. Its support for home education is provided mainly through its collaborations with Kodomo-Uchu-Mirai Association (KU-MA)² in organizing “Space School for Families”, for participation by parents and children together.

The “Space School for Families” programme consists of a several gatherings throughout the year, called “schooling”, where the participating parents and children learn together about various space-related subjects and conduct basic experiments, and are given homework assignments to be done between sessions using the learning materials distributed during the schooling. While similar to the programme of regular schools, this programme is unique in providing opportunities for the parents and their children to share time together at home to discuss space-related topics and to conduct experiments as homework. Through “Space School for Families”, the Center aims to enhance parent-child relationships and help create conducive learning environment at home.

D. International Activities

The Space Education Center continues to expand collaborations with entities of other countries and international organizations to promote space education. In this effort, the Center uses as much as possible the existing frameworks for cooperation in space activities and endeavours to create synergies of efforts made through different frameworks.



² “Kodomo”, “Uchu”, “Mirai” mean “Children”, “Space”, “Future” in Japanese language.

Through its international activities, the Center places emphasis on enhancing benefits for primary and secondary school teachers and children through space education, particularly in Asia and the Pacific. The space education initiatives taken within the framework of the Asia-Pacific Regional Space Agency Forum (APRSAF) for primary and secondary school teachers and students, therefore, are given high priority.

While recognizing benefits of introducing programs and materials developed by other space agencies with established education programs for use by Japanese teachers and schools, the Center also makes efforts to share its space education principles and approaches as well as materials particularly with developing countries that are increasingly interested in and capable of carrying out space activities.

As for developing countries in other regions, the Center supports their space education activities through initiatives taken by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and other entities of the United Nations system as well as development agencies, such as Japan International Cooperation Agency (JICA).

Cooperation with space-faring nations in space education activities is pursued mainly through the framework for cooperation provided by the International Space Education Board (ISEB).

E. Dissimination of Information and Publications

The Space Education Center uses Internet-based services and publications as its main tools to disseminate information.

As for the Internet-based services, the Center provides information on its activities, including announcements for upcoming events, campaigns, and reports on past activities and distributes updated on-line education materials and programs. Information and explanatory notes on various space-related topics are also available through the Space Information Center, an on-line information service that can be accessed through the Center's web site.

The web site of the Center (<http://www.edu.jaxa.jp>) aims to achieve the following objectives: i) to serve as the focal point to disseminate information



on space education activities and to provide a forum for exchanging ideas and information among educators; ii) to provide education materials, images and pictures that can be easily downloaded for use by educators in classroom teaching; iii) to make available in a most efficient manner the teaching and learning materials developed through the Center's support to schools as well as reports on the classroom activities supported by the Center. Its web site continues to be upgraded, and it now contains movie files and video clips.

In the past year, the Center focused on the following strategies: i) to create a conducive environment for any school teachers, leaders and instructors of space education activities as well as any individuals interested in space education to communicate and interact with each other and to exchange ideas and education materials; ii) to actively pursue other means of disseminating information rather than on-line services; iii) to use movie clips to report on the activities so as to make the users of the web site feel as if they were at the venues of those activities; iv) to reorganize the Space Information Center to make it more user-friendly and to make the content easier to understand by the general public.



Web site of the Space Education Center: <http://edu.jaxa.jp>

A. Support for Informal Education

1. For young people: from kindergarten to high-school students

Most of the activities for young people that the Center supports continue to be carried out as part of “Cosmic College”, which aims to achieve the following objectives: i) to increase interest of young people in science and technology; ii) to help establish voluntary groups of young people that are fond of science and technology; iii) to motivate young people to raise questions, think and find solutions by themselves; iv) to encourage collaborations with others; v) to lead young people to appreciate the importance of life. The Cosmic College offers three courses, covering from kindergarten to high school students. In addition to the Cosmic College courses, the Center also supports a few other recurrent space education events and special events for young people.

In supporting the organization of Informal Education activities, the Center has continued to work closely with the Young Astronaut Club (YAC)-Japan, an incorporated foundation originally established in 1986 and currently has 140 branches across the country and about 3,500 members to carry out educational activities addressing space and science.

a. Cosmic College: Kids Course

The “Kids Course” is for children younger than the second-year in elementary school and their parents to participate. The programme uses principles founded in space as it aims to increase interest of the participating children in and their familiarity of the surrounding nature. Through hands-on activities involving observations, experiments and handicraft work, the programme is designed to cultivate young children’s scientific thinking and to build the basis for logical thinking process.



b. Cosmic College: Fundamental Course

The “Fundamental Course” is for the school students between the third-year in elementary school and the third-year in junior high school. The programme aims to localize students’ perspective of space while enhancing their interest in surrounding natural objects and phenomena. Through hands-on activities involving scientific observations, experiments and handcraft work designed for the study of nature, the programme aims to enhance students’ scientific and logical thinking capabilities.



c. Cosmic College: Space Camp

The “Space Camp” is for a wide range of students starting from the fourth grade of elementary school all the way to senior high school. The programme takes place over multiple days and participants stay on JAXA’s field centers the entire time while spending the night in the dormitories with their peers. They are given the opportunity to directly observe the space development team with the finest and most advanced facilities and technology at the camp. Through hands-on activities involving scientific observations, experiments and handcraft work, the programme leads the students to pose scientific questions and come up with answers for those questions by themselves. The programme aims to enhance their scientific and logical thinking capabilities.



d. Other recurrent activities

At Sagami-hara Campus, the Space Education Center organizes a five-day training programme for high school students, during their summer vacation period, to learn how to design scientific missions through teamwork and to experience the mission evaluation, requiring them to present their missions and respond to questions from the audience, including leading space scientists and engineers of JAXA. This programme is known as “Space Mission High School”, or “Kimiission”, which is a combination of “Kimi”, or “you” in Japanese, and “mission”.

The Center assists, upon request, other departments and offices of



Group discussions and presentations during “Kimiission”

JAXA in organizing, or co-organizing with other research entities to create educational activities for young people. Such activities include Space Schools, organized by the Institute of Space and Astronautical Science (ISAS), to provide the students with opportunities to interact with its leading space scientists, Microgravity Experiment Contests, by the Space Environment Utilization Center to provide the selected students with opportunities to conduct microgravity experiments during parabolic flights, and Science Camps, hosted by Space and Field Centers of JAXA in Tsukuba, Tanegashima, Chofu and Kakuta and organized by Japan Science Foundation, for the students to visit space facilities, listen to lectures by leading space engineers and to experience the making and launching of model rockets.

e. Special events

The Center supported the “CanSat Kohshien”³. Each participating high school student team builds a “CanSat”, nano-scale quasi-satellite model weighing 350 to 1050 grams with all basic functions of a satellite fitted into a soda can of 350 ml, and its carrier to be placed onboard a model rocket.



Lecture of “School of Space” by ISAS



Microgravity experiment by the students



Science Camp



All Japan Water Rocket Contest



CanSat Kohshien

³ “Kohshien” is the name of the prestigious ballpark in Hyogo Prefecture where the traditional Japan High School Baseball Championship is held every summer with the participation of about 50 high school teams selected through the prefectural tournaments.

2. For educators and instructors of space education

The Center has been offering Space Education Leaders Seminars for instructors of space education activities. In 2009, the Center began to offer training opportunities for those instructors with experience to further enhance their knowledge about space education and their skills. The support system for the Space Education Leaders (SEL) who have completed the Seminars has also been enhanced to facilitate communication among them and to provide material support for their space education activities.

a. Space Education Leaders Seminar

The Space Education Leaders (SEL) Seminar is for any individual interested in carrying out space education activities with or without experience in informal education activities. The programme aims to transfer to the participants basic knowledge and skills that are required to be able to demonstrate space education activities. Among other things, the participants learn about the goals and principles of space education, role of leaders and understanding children's needs, as well as crisis management and safety measures.

The SEL Skill-Up Course is for those individuals who have completed the above Seminar and who wish to improve their skills in conducting space education activities. Through this Course, the participants obtain the latest news on the developments with space activities, basic knowledge in the aerospace area required to carry out space education activities as well as know-how and skills for activity management, teaching skills and methods to develop educational materials.

b. Space Education Leaders Support System

As part of its support to the Space Education Leaders (SEL) who have completed the SEL Seminar in the past three years, the Space Education Center has a financial support system, and a rental system for its education materials and equipment for use during their space education activities. The rental period is up to one month, and the use of materials and equipment of the Center requires the Center's prior approval. After the completion of the activities, the users are requested to provide feedback on the rented materials and equipment.



Space Education Leaders Seminar



Space Education Leaders Skill-Up Course



Space suits for rent

B. International Activities

1. Focusing on children in Asia: Asia-Pacific Regional Space Agency Forum

a) Space Education and Awareness Working Group

The Space Education Center has supported educational activities of Asia-Pacific Regional Space Agency Forum (APRSAF) since 2005 and has served as the Secretariat of APRSAF Space Education and Awareness Working Group since 2006. Currently consisting of members from 17 countries and 3 international organizations and one associate member organization⁴, the Working Group has become increasingly active in the past few years with the aim of: i) effectively using space materials to enhance education for young people; ii) providing education and training opportunities for young people in space science and technology; iii) contributing to enhancing mutual understanding among countries in the region through exchange opportunities for young people; and iv) increasing public awareness of the societal benefits and importance of space activities.

In addition to organizing space education events for primary and secondary school teachers and students, the Working Group has strengthened efforts toward: i) making more teaching and learning materials available in local languages; ii) aligning its space education efforts with global educational initiatives taken by the entities of the United Nations system and other international organizations; and iii) contributing to enhancing inter-regional cooperation by making it possible for countries of other regions to benefit from its space education initiatives.



Working Group members during APRSAF-18, held in Singapore, December 2011

⁴ Australia, Bangladesh, Cambodia, India, Indonesia, Japan, Kazakhstan, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Sri Lanka, Thailand, Vietnam, Asian Institute of Technology, the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) and the United Nations Office for Outer Space Affairs (UNOOSA) are currently members of the Working Group, and Space Generation Advisory Board(SGAC) is current associate member of the Working Group.

b) Water Rocket Event

Starting from 2005, the Working Group has organized the Water Rocket Event each year, immediately following the APRSAF session. This annual regional Event has provided opportunities for young people between 12 and 16 years old not only to learn about basics of rocket science and space activities in general, but also to learn about other countries and their cultures, to build lasting friendships beyond national borders based on the common interest in space.



Getting ready for launch, Singapore December 2011



APRSAF-12 Water Rocket Event, Kitakyushu, Japan, 2005



APRSAF-13 Water Rocket Event, Jakarta, Indonesia, 2006



APRSAF-14 Water Rocket Event, Bangalore, India, 2007



APRSAF-15 Water Rocket Event, Ha Noi, Vietnam, 2008



APRSAF-16 Water Rocket Event, Bangkok, Thailand, 2010



APRSAF-17 Water Rocket Event, Melbourne, Australia, 2010



APRSAF-18 Water Rocket Event, Singapore, 2011

c) Poster Contest

The Working Group has organized a Poster Contest under a selected theme each year since 2006 during the APRSAF session, for children between 8 and 11 years of age. From among those posters submitted by the participating countries, the participants of the APRSAF session vote to select the best poster, for APRSAF Best Poster Award, and the second and third best posters for APRSAF Special Poster Awards.



Poster by a Malaysian student who won APRSAF-18 Best Poster Award



Poster by a Japanese student who won APRSAF-18 Special Award



Poster by a Malaysian student who won APRSAF-18 Special Award



Poster Contest in Jakarta, Indonesia, 2006 under the theme "Importance of Space"



Poster Contest in Bangalore, India, 2007 under the theme "50 Years in Space"



Poster Contest in Ha Noi, Vietnam, 2008 under the theme "Wonders of the Universe"



Poster Contest in Bangkok, Thailand, 2010 under the theme "Our Universe-Great Discoveries"



Poster Contest in Melbourne, Australia, 2010 under the theme "Space Technology to Help the Earth"



Poster Contest in Singapore, 2011 under the theme "The Next 50 Years in Space"

d) Space Education Forums and Seminars

The Working Group convened space education forums and seminars in Vietnam and Indonesia in 2006, Sri Lanka in 2009, Bangladesh in 2011 and Nepal in 2012, as a response to the need for providing opportunities for students and teachers of primary and secondary schools particularly in developing countries. The aim is to enhance their understanding of space science and technology and their applications and to participate in hands-on space education activities.



Making bubble-rockets during hands-on session of the Space Education Seminar, Sri Lanka

e) International Water Rocket Event Workshop

In order to expand the pool of skilled and informed educators who can effectively use water rockets to enhance education for young people and to establish a network of those educators, the International Water Rocket Education Workshop was hosted by Victorian Space Science Centre (VSSEC) in Melbourne, Australia, from 30 June to 3 July 2008. Teachers, educators and space experts from 12 countries in Asia and the Pacific as well as Latin America participated in the Workshop, which resulted in establishing an Internet-based Wiki site to serve as an on-line forum for any interested teachers and educators to exchange information, views and education materials relating to water rockets.

(See Wiki site: http://wiki.vssec.vic.edu.au/waterrockets/index.php?title=Main_Page).

Looking back over the years, the Working Group has created the report of a brochure on water rocket activities for educational purposes to seek for sponsorship by not only space-related public entities, but also commercial entities in September 2010.



Flight testing various types of water rockets

2. Collaboration with advanced space-faring nations: International Space Education Board

The Space Education Center represents JAXA in the International Space Education Board (ISEB) and collaborates with other ISEB members to promote space education. Established in October 2005 by the Canadian Space Agency (CSA), the European Space Agency (ESA), the National Aeronautics and Space Administration of the United States (NASA) and JAXA as its Founding Members, ISEB now includes Centre National d'Etudes Spatiales (CNES), the French space agency, as Member from October 2006 and VSSEC as Associate Member from October 2010. The objectives of ISEB are: i) to increase science, technology, engineering and mathematics literacy achievement in connection with space; and ii) to support the future workforce needs of space programs. While ISEB meets once a year with the participation of heads of education of its member agencies during the annual IAC, the activities of ISEB are being carried out and coordinated by its Representative Working Group, consisting of one officer each from the



Establishing ISEB in October 2005

ISEB member agencies. The membership is open to any public organization carrying out space activities and pursuing education programmes.

a) Activities

In 2011 and 2012, the following projects were carried out within the framework of ISEB: i) international student programs at the International Astronautical Congresses (IAC's) held in Cape Town, South Africa in September/October 2011; ii) international participation in NASA Academy; iii) CanSat activities. The use of the International Space Station for educational purposes is also recognised as an important initiative that needs to be undertaken.

The Space Education Center continued to support the activities of ISEB by participating in the organization of IAC Student Programs, and sending Japanese students for those Programs and supporting the participation of Japanese undergraduate and graduate students in NASA Academies, held at Goddard Space Flight Center in summer 2008, 2010 and 2011, and Ames Research in summer 2009 and 2012.

b) Chairmanship

The term of the chairmanship is one year, and it rotates among the Founding members. Following its successful initial year under the chairmanship of ESA, ISEB was chaired by NASA from October 2006, by CSA from September 2007 and by JAXA from October 2008, by ESA from October 2009, by NASA from October 2010, and CSA is currently serving as the chair again.

3. Pursuing cooperation with developing countries outside Asia

a) Supporting UNESCO efforts

Upon invitation by UNESCO, the Space Education Center participated in workshops organized by UNESCO in and for developing countries. Following its participation for the first time when the workshops were held in multiple cities of Colombia in November and December 2005, the Center has participated to date in those workshops held in multiple cities in Ecuador, Peru, Tanzania and Vietnam.



Interactions with Heads of Agencies, IAC 2011, Cape Town, South Africa



Lunch time event at International Student Zone, IAC 2011, Cape Town, South Africa



Participants of the workshop with the Deputy Minister of Education and Vocational Training at the center, Dar-es-Salaam, Tanzania

From 2008 to 2010, the Center introduced water rockets as educational activities and supported hands-on session for school children to experience the launch of water rockets at the workshops held in Dar-es-Salaam and Arusha, Tanzania, in May 2008, Lima, Peru, in June 2009, and the Philippines in February 2010.

At the regional space camp held in Ibarra, Ecuador, in May 2008 for teachers and students from 5 Latin American countries, i.e. Argentina, Brazil, Chile, Ecuador and Peru, the Center also helped organize the session to build water rockets and the water rocket launch competition. Lectures on water rocket theory at an advanced level were also offered at the space camps held in Salinas and Puerto Aroyo, Galapagos, Ecuador in June 2009, where college students participated.



Head of the space agency of Peru conducting the first water rocket launch, Lima, Peru



Mayor of Ibarra opening the water rocket competition



Water rocket lecture and launch in Salinas, Ecuador



....and in Puerto Ayora, St. Cruz, Galapagos, Ecuador

b) Supporting water rocket activities around the world

The partnership with UNESCO has turned out to be effective in promoting water rocket activities for educational purposes, using the materials provided by the Space Education Center. It has opened the door for collaborations with those other developing countries with emerging space capabilities with willingness to initiate space education activities to reach out to a large number of school teachers. As part of such collaborations, the Center has continued to support water rocket events as well as associated teachers seminars held in Argentina, Brazil, Chile, Colombia, Ecuador, Nigeria, Philippines, Vietnam and Bangladesh.



Teaching physics in Argentina using water rockets

While the Center has introduced its teaching methods and materials in developing countries, it has also benefited from inputs provided by enthusiastic teachers and educators in developing countries.

Building upon the Educator's Manual for Water Rockets developed by the Center and translated into Spanish in cooperation with UNESCO, teachers in some countries, such as Argentina, have developed advanced teaching materials to meet the needs of their classes.

The map below shows the countries to which the Center provided technical and material support for their water rocket activities. The Center continues to receive various ideas from teachers and educators in those countries.



Teachers training in Brazil



Water rocket workshop in Chile



Water rocket competition during Space Adventure, Baranquilla, Colombia

c) Supporting Japan International Cooperation Agency (JICA) as part of its training programme

In response to requests by Japan International Cooperation Agency (JICA), the Center received groups of African science teachers in September in 2006, 2007 and 2008 to introduce space education. The Center provided short hands-on sessions for those teachers to use space materials and resources to stimulate interest of students in science classes. In total, the Center provided such opportunities to 24 science teachers from 9 African countries, i.e. Kenya, Gambia, Ghana, Lesotho, Malawi, Namibia, South Africa, Tanzania and Uganda.

In addition, liaison council of JAXA-JICA has started since January



Welcoming the group of science teachers from African countries, 2008

2008, and discussions regarding Space Education for developing countries were brought up in the 3rd meeting held in February 2011. JAXA Space Education Center and JICA are collaborating together to hold Space Education Leader Seminars since November 2011 in 2 JICA training facilities, Kamagane and Nihonmatsu. These seminars are held every quarter and the number of participants from the JICA dispatch members have increased each session.

4. Other collaborations: providing education opportunities outside Asia for graduate students

In cooperation with the International Space University (ISU), the Space Education Center continues to provide scholarships for Japanese university and graduate students to participate in the Space Studies Program (SSP), a nine-week course held between June and August by ISU at a different location each year around the globe, and the degree programs for Master of Science in Space Studies and Master of Science in Space Management (MSS/MSM), a one-year course held at ISU main campus in Strasbourg, France. Starting from 2008, the Center also provides funding support for Japanese university and graduate students to participate in the annual symposium organized by ISU in February.

With more than 3,000 alumni worldwide and several hundred faculty and lecturers drawn from around the world, ISU offers unique programmes that are international, interdisciplinary and inter-cultural in nature. Based on the Memorandum of Understanding concluded between JAXA and ISU in December 2003, JAXA supports the activities of ISU by receiving MSS/MSM students as interns at JAXA research facilities, sending JAXA staff as lecturers for SSP and MSM/MSM and participating in the Board of Trustees of ISU.



ISU Campus in Illkirsch, France
(Photographs: Courtesy of ISU)



ISU Annual Symposium in 2012

V. RECENT ACHIEVEMENTS

A. Support for Formal Education

1. Introducing space education at schools across the country

Providing customized support to teachers and schools consumes a large amount of staff time and effort. A classroom activity plan consists of normally more than one class, and the period required to implement the plan could last for one full academic year, requiring at least several visits by the Center's staff and experts. The Center has, nonetheless, continued this labour-intensive approach to support school education with a team of 5 staff members.

Numbers of schools supported by the Center and the students benefited from the support

	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011	
	Schools	Students	Schools	Students	Schools	Students	Schools	Students	Schools	Students
Kindergarten	1	94	2	150	3	250	0	0	0	0
Elementary Schools	18	1,634	14	1,177	34	2,105	36	2,916	44	4,251
Junior High Schools	6	817	14	1,088	18	1,348	16	1,497	24	2,070
High Schools	17	1,499	20	594	12	537	14	821	14	1,195
TOTAL	42	4,044	50	3,009	67	4,240	66	5,234	82	7,516

NOTE: Japanese fiscal year starts from April 1 to next March 31.

It should be noted that in the past year, some schools that had received support from the Center in the preceding years have continued classroom activities with the use of space materials without support from the Center. Through administered transfers from one school to another, some of those teachers who had been supported by the Center in the past have begun their classroom activities with the use of space materials at their new schools by themselves. There are apparently more schools that have started or that are carrying out classroom activities using space materials than the above statistics indicate.

Another major development is the increased opportunities for teachers training in space education through collaborations with, for example, boards of education or faculties of education. The Center started its support for the faculty of education by organizing one space education training session in 2007. During the fiscal year 2008, three such sessions were organized with the support of the Center. As for the previous fiscal year, four sessions have been organized, benefiting 396 students. The number of

training sessions that the Center supported for those teachers who are already teaching at school has also increased over the past years, from one in the fiscal year 2005 to 42 in the fiscal year 2011.

Number of teacher training sessions and participants

	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011	
	Sessions	Students/Teachers	Sessions	Students/Teachers	Sessions	Students/Teachers	Sessions	Students/Teachers	Sessions	Students/Teachers
For candidates for teachers	1	156	3	234	2	265	3	324	4	396
For teachers	7	242	39	1,186	36	1,163	30	1,320	42	2,925
TOTAL	8	398	42	1,420	38	1,428	33	1,644	46	3,321

2. JAXA Space Education TV Conference Class: Ogaki Ehigasi Elementary School and Kurashiki Otoshimahigashi Elementary School

6th Grade students in the Gifu and Okayama prefecture elementary schools were given the opportunity to share with each other what they have learned in their science classes with each other via video conference in November, 2011 and February, 2012. The students introduced their schools, exchanged information regarding space foods and the moon and talked about the environmental differences between the earth and outer space. Students were able to improve their ability to think, express themselves and make judgments by sharing each others' ideas and accomplishments through this course.



3. Let's Learn about Rockets ~Researching and Experiencing about Rockets and Space~: Shimosuwa Junior High School

The Space Education Center worked in cooperation with Shimosuwa Junior High School, in the Nagano Prefecture, from May to November 2011 during their integrated study periods on the subject of outer space. The course was aimed toward 7th and 8th grade students who researched the theory and composition of rockets, made model rockets out of paper and umbrella bags and presented their research and rockets at the school cultural festival. Through this activity students were able to internalize how space affects their daily lives, learn the schematics of building rockets and spark interest in outer space as a whole.



4. Kudan Independence Plan: Chiyoda-Ward Kudan Junior High School, Tokyo

JAXA worked in cooperation with Kudan Junior High School in June to December 2011 during their integrated study periods on environmental science. The 7th Grade students split up into groups and select a theme they would like to pursue. This course was done in accordance with other organizations. JAXA explained the use of satellites to observe the environmental changes of the earth and discussed the possibilities of space habitation. Students learned of current environmental issues, maintaining a symbiotic relationship with nature and seeing how these studies could lead to career opportunities.



5. Japanese Space Food Development: Fukui Obama Fisheries High School

The Space Education Center cooperated with Obama Fisheries High School in developing space food in their food processing class from April to October 2010. The school's 12th Grade class participated in 23 classes to learn about space food, the issues in the local marine product industry, do market research, investigate manufacturing processes and teach elementary school students how to make Space Caramel. Students were able to deepen their interest in space in addition to further engaging them with the marine product industry. They were able to learn technical skills in both space and their own field of study which will help them become independent, innovative learners.



B. Support for Informal Education

Reflecting the success of the Center's strategy to transfer the central responsibilities as the organizers to the local communities, the number of space education events organized around the country continues to increase while the level of financial and manual resources remained the same.

Number of events and participants of Cosmic College courses

	FY 2009		FY 2010		FY 2011	
	Events	Participants	Events	Participants	Events	Participants
Kids Course	46	3,476	49	2,286	57	4,203
Fundamental Course	81	5,610	103	10,567	128	10,243
Space Camp	3	88	10	215	9	262
TOTAL	130	9,174	162	13,068	194	14,708

NOTE: Japanese Fiscal year starts from April 1 to next March 31.

The pool of space educators and instructors who have newly received training from the Space Education Leaders Seminar continues to expand. As for the current fiscal year, FY2011, the number of participants of the Space Education Leaders Seminars as well as its Skill-Up Courses that have been organized to date is over 1000.

Number of Space Education Leaders (cumulative)

FY 2009	FY 2010	FY 2011
661	676	909

As the number of space education events continues to increase, the demand for use of the teaching materials developed by the Center also increased. In the past year, the Center reorganized its system of managing its numerous learning and teaching materials, packaging some materials for ready-use and immediate rental for selected activities and monitoring the frequency of use. The packaged materials include those activities to make and launch water rockets, syringe rockets, umbrella-bag rockets and hot-air balloons, conducting micro-gravity experiments and experiments with atmospheric pressure and comparing models of the Moon and the Earth, to name a few examples.

C. Support for Education at Home

The series of “Space School for Families” in collaboration with KU-MA (Kodomo Uchu-Mirai Association) began as a separate and distinctive programme since April 2009. During the last fiscal year, 31 courses were organized totaling 3,890 participants.

The success of this new programme is reflected not only in terms of the quantity of the courses and participants, but also in the feedback from the parents who participated in the schools. The Center has received positive comments from a number of parents who appreciated the opportunities to do something with their children to think, to conduct simple experiments and to discuss with their children at schooling sessions and at home.

Through the programme offered by the Space School for Families, some parents discovered and treasured what their children really enjoy doing.

For the Space School for Families, series of teaching guides on typical hands-on activities continue to be produced, covering various scientific topics under the following 12 themes: i) flight and floating; ii) light; iii) soil and sand; iv) water; v) air (atmosphere); vi) heat, temperature and combustion; vii) electricity and magnetism; viii) force and motion; ix) breeding of animals and cultivation of flower and plants; x) field observations; xi) sound; and xii) Sun and its companions. As of March 2012, 80 sets of teaching guides have been developed.



Number of teacher training sessions and participants

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Course	Nil	3	15	20	31
Participants	Nil	1,037	2,000	3,187	3,890

D. International Activities

1. ISEB Student Program

During IAC2011 Cape Town, South Africa, ISEB student program sponsored students from each agency and organized academic presentation sessions by specialists, student presentations, Q&A Sessions with respective Heads of Agencies, and held an outreach activity for local learners, age 8 to 11, to invite them to the IAC. They held a workshop using legos and other crafts and took time to visit the booths of different space agencies.



2. APRSAF Water Rocket Event

In 2011, the seventh APRSAF Water Rocket Event was held in Singapore on 3 and 4 December 2011, in conjunction with APRSAF-18. 55 students and 42 teachers and leaders from 17 countries participated in the event. The eighth APRSAF Water Rocket Event is planned to be held in Malaysia on 8 and 9 December 2012, immediately preceding APRSAF-19.



3. APRSAF Poster Contest

In 2011, the APRSAF Poster Contest was held at APRSAF-18, to contribute the commemoration of 50 years of human space flight in honor of Yuri Gagarin. The Working Group had produced a calendar for April 2012 – March 2013 using the posters submitted for the APRSAF-18 Poster Contest, held with the theme “The Next 50 Years in Space”. 30 posters were submitted from 10 countries and the winners of the Awards were announced during APRSAF-18. The next Poster Contest will hold the theme of “Friends in Space” to celebrate the International Year of Cooperatives.



Calendar for 2012, with posters submitted to APRSAF-18 Poster Contest

4. Space Education Seminar

The Space Education Center and Nepal Scientific Activities and Research Centre (NESARC) jointly held a Space Education Seminar, “Space Science and Technology and their Applications into classrooms”, in cooperation with GISTDA of Thailand, in Kathmandu, Nepal in March 2012. The Chairman of the Constitution Assembly of Nepal was in attendance as Chief Guest as the Ministry of Science and Technology and Congress of Nepal supported the seminar.



GISTDA and JAXA representatives gave lectures and demonstrated hands on activities for local teachers to use satellite images in the classroom and create film case rockets and injection rockets using materials easily found at home.

E. Dissimination of Information and Publications

The Space Education Center develops many materials to correspond with its various activities. Examples of such materials include: Activity manuals that will help participants become more conscious of their connection to space, Instruction manuals to help local teachers and leaders educate students and their community about space, Materials on how to introduce the subject of space in the classroom in a manner which will pique students' interest and "Space School for Families" materials that will give parents and their children opportunities to learn about space together and perform experiments using household items.

There are over 200 materials that have been archived into an online database. With the improved layout of the webpage and updated search engine, materials have become more accessible to users.

Among the newest materials that were developed were videos of various experiments taken by Japanese astronauts while aboard the International Space Station. These experiments were first performed in on earth, and the astronaut would compare the results after the experiments were performed in space. Experiments titled "Bernoulli's Theorem", "Water and Space" and "Inertia and Energy" were organized in 2010, and "Weight and Mass of Objects" and "The Mysteries of Space Environment" were performed in 2011. In addition, the Center made a video comprised of several replicated zero gravity experiments that took place on a parabolic flight.

The Space Education Center set up a campaign called "Let's Observe the Total Lunar Eclipse Together" on its website to raise children's awareness and interest in astronomy in accordance with the total lunar eclipse that took place in Japan on 10 December 2011. Children were asked to take pictures of the lunar eclipse and post the pictures onto the website. The campaign gathered approximately 400 photo submissions.



School Wall Newspaper



Quarterly magazine, "Sora e no Tobira" ("Door toward Space")



Space Education TV Channel

As alternative means to Internet-based services, the Center has continued to issue paper-based publications on a regular basis. The Center has continued to distribute newsletters, in the form of school wall newspapers to about 10,000 elementary and junior high schools in the country. For “Science for Kids”, a monthly journal for children, the Center has continued to contribute articles on its activities. The 19th issue of the quarterly journal, “Sora e no Tobira” (“Door toward Space” in Japanese), has been issued in March 2012. The purpose of the journal is to deliver the most recent Space News and to report on recent Space Education Activities. It is also a tool that is used to publicize upcoming events.

Starting from April 2009, the Center significantly increased the frequency of real-time television broadcasting to provide live coverage of not only the rocket launches but also space education events organized by the Center. The Center aims to provide such live coverage through “Space Education TV Channel” which is broadcasted on average twice a month. From April 2011 to March 2012, 35 programmes were broadcasted through the “Space Education TV Channel”. All these broadcasted programmes have been archived and made available on-line. On 10 December 2011, the Channel held a special live broadcast of the Lunar Eclipse in Japan. The special episode attracted over 680,000 viewers throughout the broadcast.

VI. STRATEGIC ALLIANCES AND ESTABLISHMENT OF Footholds

The Center further strengthened its collaborations with other offices and departments of JAXA, industries and national research institutes while continuing its collaborations with the non-governmental, non-profit organizations engaged in space education activities by reaffirming its conviction that the collaborations with all stakeholders would be the key to success in further expanding space education activities at various levels of school education and many different places and occasions.

As a result of its increased efforts to collaborate with interested industries, some of the courses of the Cosmic College were co-organized with Panasonic Corporation, Discovery Channel and The Sankei Shimbun Co., Ltd.. In the case of the Discovery Channel, which broadcasted advertisements of the Cosmic College courses, eleven courses have been organized together, and the event attracted about more than 200 participants.

Since 2010, the Center began to vigorously pursue collaborations with national research institutes, such as Japan Agency for Marine-Earth Science and Technology (JAMSTEC), National Astronomical Observatory of Japan (NAOJ) and RIKEN, to have their researchers and experts involved in not only co-organizing educational events but also in the development of programme contents and planning for future activities.

Significant progress has been made in the collaborations with publishing companies producing textbooks and supplementary learning materials. In response to 127 requests from 45 such companies, the Center has provided images and data resulting from space activities and projects of JAXA for use in the textbooks and supplementary learning materials for not only science but also other classes, including those for Japanese and English languages, geography, agriculture and homemaking.

To provide a systematic framework of support by leading researchers and experts from various disciplinary areas who are committed to space education efforts, the Center is establishing the Space Education Advisory Board. The Advisory Board would provide advice on the overall executive directions to be pursued by the Center as well as its major policies concerning the implementation of its programmes, support for space education leaders and development of educational materials. Under this



Collaborations with Discovery Channel

Advisory Board, the establishment of two working groups, one on space education materials and the other on space education activities, is also envisaged.

VII. CONCLUDING REMARKS

Two years has passed since the Hayabusa Spacecraft returned to earth. There are already 3 films that have been made in regardance to the Hayabusa. There are other movies that have been produced about space missions like "Apollo 13", but it is rare to see multiple films on the same mission. The three films attracted about 1.4 million viewers combined. The capsule that brought back the asteroid sample has been put on display at each of the 47 Prefectures in Japan in 69 venues with a total of over 890,000 visitors. There are many children who know what the Hayabusa is, even if they do not know what JAXA is. Eventually children started personifying the spacecraft by calling it "Hayabusa-kun" (the suffix "kun" is generally used for young boys). This personification was not done intentionally, but came naturally as the children became personally attached to the mission. It is interesting to think about what the children feel after learning about how the spacecraft overcame many trials and tribulations to eventually make it back home. Perhaps they fell in love with the tenacity of the Hayabusa and its staff. Hope, endurance, sadness, never giving up, curiosity, adventurous and the importance of crafting are perhaps among other emotions children may have felt.

Young children will create memories with events that give a strong impression and will remember them for their entire lives. This is where the fundamentals of Space Education lies. We are to help children treasure these precious memories especially in their youth. There are so many possibilities to create such memories even outside of the labors of the Hayabusa. JAXA's Space Education Center would like to continue to contribute to the wholesome growth of today's youth through our slogan, "Space will ignite the children's hearts" so they can take care of themselves, their friends, family, the earth and outer space.



Report of JAXA Space Education Center
On Its Activities in 2011–2012

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