NATIONAL SCIENCE AND TECHNOLOGY MUSEUM

Annual Report

2012

國立科學工藝博物館
NATIONAL SCIENCE AND TECHNOLOGY MUSEUM

2012

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Annual Report

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Foreword from the Director-general

It has been 16 years now since the National Science and Technology Museum (NSTM) opened in November 1997. Based on the three main operational targets: “create a friendly environment”, “improve professional quality”, and “accumulate sustainable capital”, we have been making full use of external resources and teaming up with industrial, government, and academic networks; promoting various museum affairs; and providing a quality museum environment and rich science and technology knowledge. With the concerted effort and assistance of all employees, quasi-employees (partner suppliers), volunteers, and the public, we have won the Government Service Quality Award from the Executive Yuan.

NSTM continuously promotes the grounding and presentation of local culture. Aiming to manifest the core characteristics of our collections and research, we have extensively recruited artifacts with historical implications on the industrial development of Taiwan and further investigated and interpreted these objects and their industrial backgrounds. These include home electronics, TV, printing, textiles, locks, nanotechnology, and green industries. Apart from publishing our research findings in related academic journals, we have aggressively promoting our collections and related science educational activities to encourage the research and application of science and technology artifacts in our collation and thereby extended the heritage and glory of these collections.

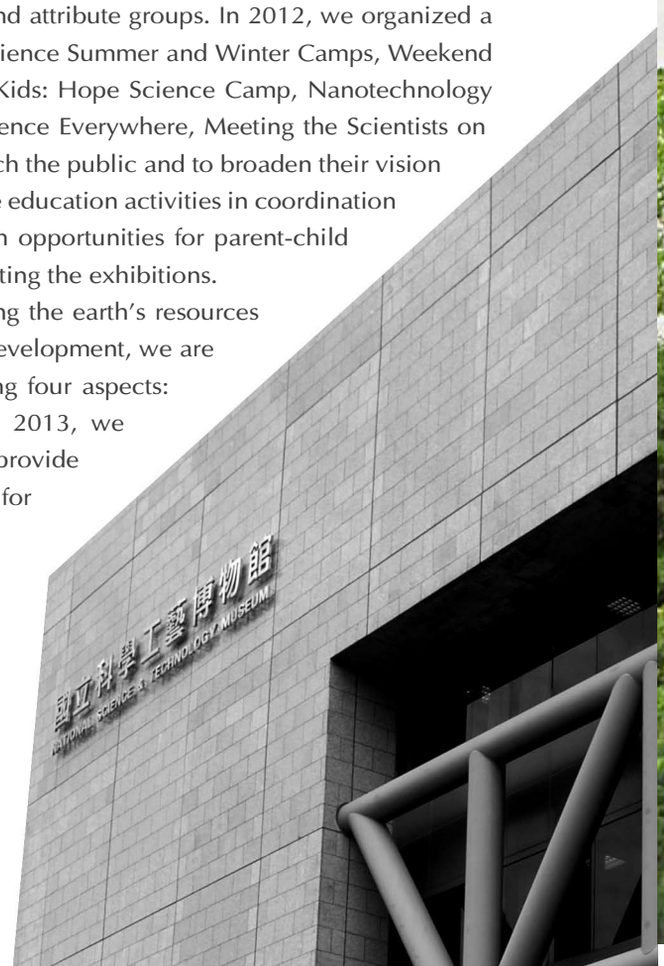
In order to provide the public with more comprehensive exhibition contents, we launched 31 exhibitions in 2012 with external resources and the planning and design of employees. These included the Ultimate 3D: The Wonder of Holograph, Quest for Immortality, Dinosaurs Dream Park, Under Keys and Locks, Art in the Minutia, Decoding the First Emperor’s Mausoleum and Silent Warriors of Ancient China, The Stunning Pop-Up Book, Liquor with Rich Stories: The Feast by the Winding Stream, Cake Town, and others. The multiple themes of technology and novel exhibition methods of these exhibitions received lots of feedback from visitors and were beloved by the public. In addition, on the 15th anniversary of NSTM we launched the “Time Traveling the NSTM” Exhibition for the public to learn more about the efforts and achievements of NSTM over the past 15 years, as well as to leave a trace and heritage for the future.

In order to cultivate science education, we have been continuously enriching related learning resources and designing various activities for different age and attribute groups. In 2012, we organized a wide variety of science education activities, including the Science Summer and Winter Camps, Weekend Fun with Science, NSTM Fun Learning, Concern for Rural Kids: Hope Science Camp, Nanotechnology Promotion Platform, Environmental Education Tour Bus, Science Everywhere, Meeting the Scientists on Sunday Science Lecture Series, and others, aiming to approach the public and to broaden their vision of science learning. In addition, we organized various science education activities in coordination with individual theme exhibitions to provide the pubic with opportunities for parent-child interactive learning and hands-on learning science while visiting the exhibitions.

Global warming issues continue to burn, and protecting the earth’s resources has become a main social issue at present. For sustainable development, we are transforming NSTM into a green museum from the following four aspects: environmental, economic, cultural, and social aspects. In 2013, we will uphold the innovation and sustainable growth spirit to provide the public with the best-quality services and a venue for comprehensive education and leisure functions, hoping to turn NSTM into the most favorite museum of the pubic and every citizen into a scientific person by enforcing the NSTM motto: Science for Life and Life with Science.

Director-general

Shiunn-Shyang Chen



Introduction

History

The National Science and Technology Museum (NSTM) was one of the central cultural facilities constructed in the "Project of County/City Cultural Center Construction" in The Twelve Construction Projects announced by the Executive Yuan in 1979. As the first museum of applied science in Taiwan as well as the first national institute of public education in Southern Taiwan, the focus of the museum is to collect and study scientific and technological objects, hold exhibitions related to science and technology and promote education as well as provide the public with a place for leisure and life long learning.

Located on Jiouru 1st Road, Kaohsiung City (originally City Park No. 6), the museum covers 18.37 hectares of land. The buildings contain a total building area of 20,682.83 m^2 and the floor area is 113,557.69 m^2 (including North building: 97,734.93 m^2; South complex: 15,258.88 m^2; LOHAS Energy Conservation House: 563.88 m^2) with 36.89 meters of structural height.

1.1. North building: 15,007.55 m^2 of building area is used for the administration center, permanent exhibition halls, temporary exhibition halls, IMAX® 3D Theater, Wa-sci Science Theater, Open Storage, Maintenance Workshop, Green Shop as well as for gifts hops.

1.2. South complex: 5,412.61 m^2 of building area is used for the Library and Audiovisual Center, research center, auditorium, lecture rooms and storage. The LOHAS Energy Conservation House was set up in 2009 and sits on an architectural dimension of 262.67 m^2

History

Brief Description of the Preparatory Process:

(1) July 1986 The Planning Council for NSTM was established.

(2) November 1988 The Executive Yuan approved the construction plan.

(3) October 2, 1989 Construction of the museum commenced.

(4) January 1, 1997 The museum was officially established with the approval of the Executive Yuan and the Ministry of Education.

(5) July 26, 1997 The south complex was opened.

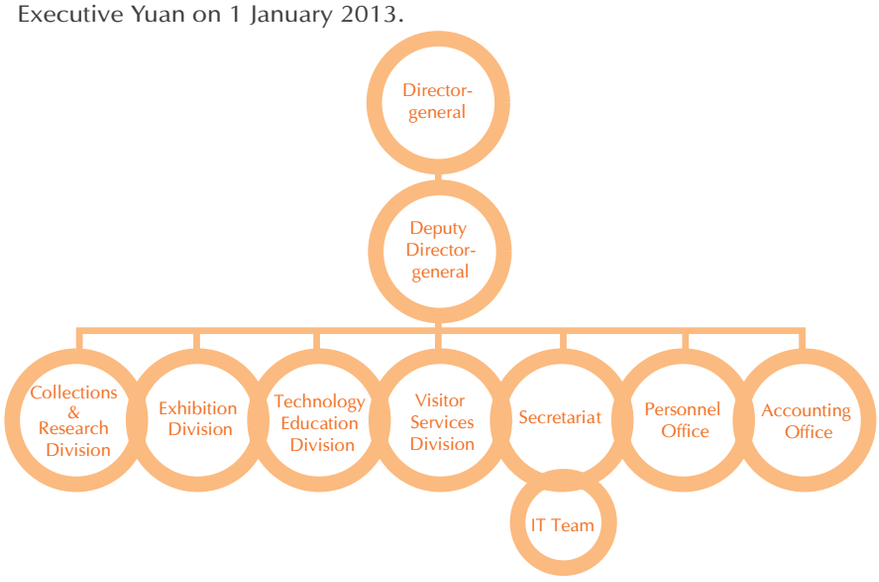
(6) September 21, 1997 The museum park was opened.

(7) November 9, 1997 The museum was opened to the public.

Organization and Staffing

2.1. Organization

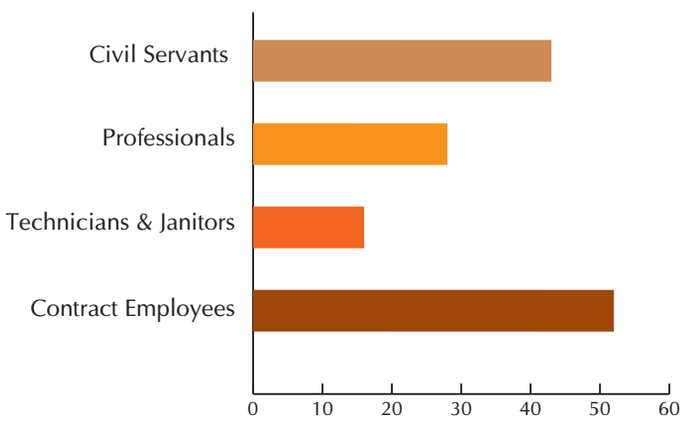
The temporary regulations and staffing structure of NSTM were established and announced according to the Letter Tai (85) Zhan-Zhi 85504426 issued by the Ministry of Education on 30 December 1996. In this structure, the museum has one director-general and one deputy director-general. Under them there are the Exhibition Division, Technology Education Division, Technology Education, Secretariat, Personnel Office, and Accounting Office. The IT team was formed as a taskforce for museum development on 16 July 1998, and the collections and research team was formed on 1 February 2001. The Collections and Research Division was officially established on 1 September 2003 after the temporary organic regulations were revised and announced according to Letter Tai-Zhan-Zhi 0920113739A issued by the Ministry of Education on 5 August 2003. The section was approved for reference by Letter Kao-Tao-Zu-(21)-Zhi 09200079281 issued by the Examination Yuan on 22 September 2003. The rule of organization of NSTM was officially established on 3 February 2012 according to Letter President Hua-Zong-(1)-Yi-Zhi 10100022841. The operation was authorized and announced according to Letter Yan-Zong-Zhi 1012260345 issued by the Executive Yuan on 1 January 2013.



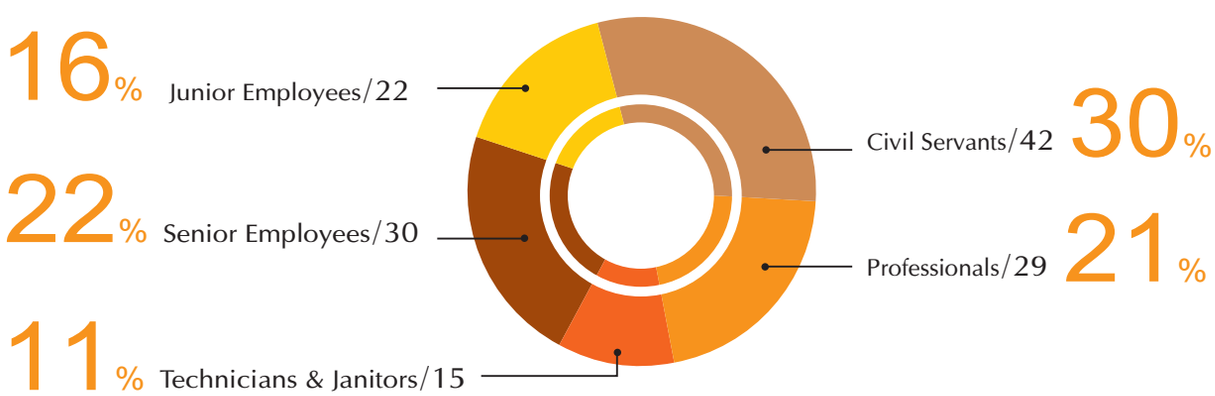
Organizational Structure

2.2.1. Statutory Staff

The statutory staffing of NSTM is 90 personnel. According to the staffing structure approved by the Ministry of Education in 2012, the staffing comprised a total of 138 people, including 42 civil servants, 29 professionals, 30 senior contract employees, 22 junior contract employees, 9 technicians, and 7 janitors. As there were 6 technicians and 3 janitors in excess of the statutory staff, their vacancies will not be refilled after their retirement or termination of employment.



Statutory Staff



The diagram below shows the statutory staffing of NSTM in 2012

2.2.2. Current Number of Staff

The present staffing of NSTM (excluding volunteers and contractors) comprises 134 personnel, including 62 males and 72 females, representing 46.27% and 53.73% respectively. There are 9 Rank 1 or higher-rank officers (including the director and deputy director), including 5 males and 4 females, while the proportion of female Top & higher-rank officers is 44.44%. Other personnel include 28 professionals (12 males and 16 females), 39 civil servants (23 males and 16 females), 52 contract employees (18 males and 34 females), and 15 technicians and janitors (9 males and 6 females). The statistics of NSTM personnel by gender are as follows:

Statistics of Rank 1 or Higher-Rank Officers and Non-Officers by Gender

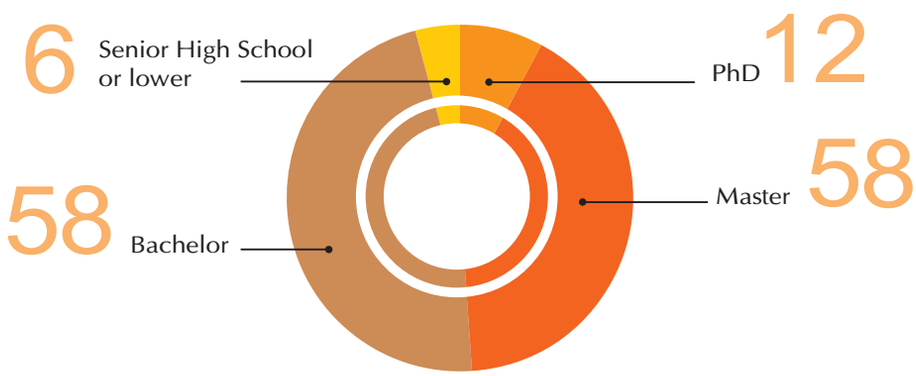
	Present Count	Male	Percentage of Male	Female	Percentage of Female
Rank 1 or higher-rank officers	9	5	55.56%	4	44.44%
Non-officers	125	57	45.60%	68	54.40%
Total	134	62	46.27%	72	53.73%

Statistics of Personnel by Gender

	Present Count	Male	Percentage of Male	Female	Percentage of Female
Professionals	28	12	42.86%	16	57.14%
Civil servants	39	23	58.97%	16	41.03%
Contract employees	52	18	34.61%	34	65.39%
Technicians & janitors	15	9	60.00%	6	40.00%
Total	134	62	46.27%	72	53.73%

2.3. Education Background of Staff

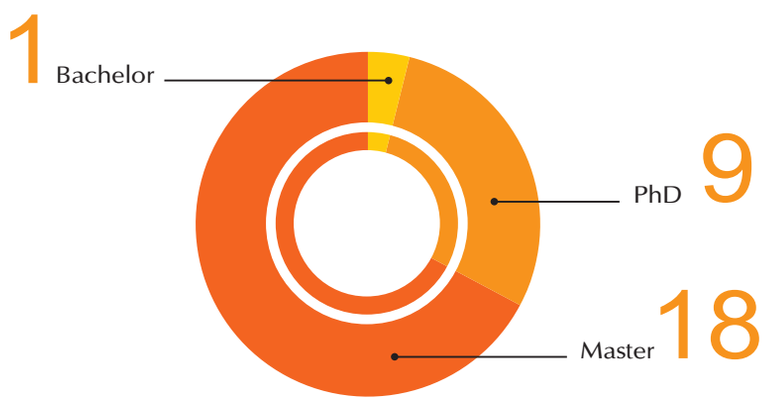
2.3.1. Statistics of education background of staff at present, there are 134 personnel, including 12 PhDs, 58 masters, 58 bachelor, and 6 senior high school graduates or lower.



Statistics on Education Attainments of NSTM Personnel

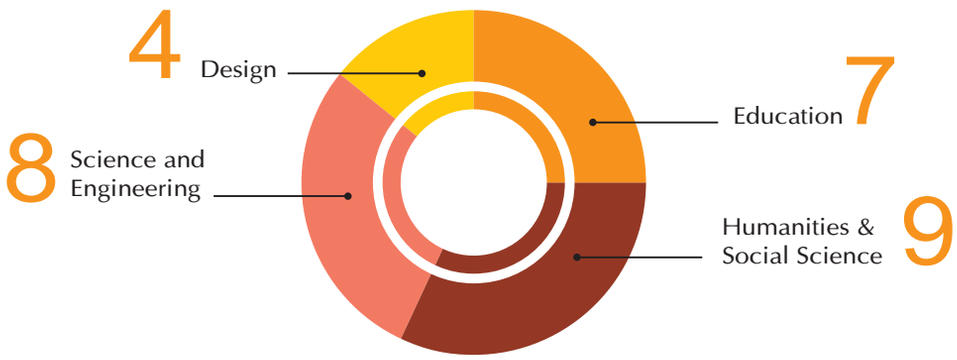
2.3.2. Statistics of professionals' education background

At present, there are 28 professionals, including 9 PhDs, 18 masters, and 1 bachelor.



2.2.3. Statistics of professionals' specialty

At present, there are 28 professionals, including 8 specialized in science and engineering, 7 in education, 4 in design, and 9 in humanities & social sciences.



Development Missions

(1) To reinforce technological collections management and research: continuation of holding conservation and maintenance seminars and improving the conservation environment, as well as strengthening research and applications for technological collections.

(2) To establish an exhibition renewal mechanism and gradually alter exhibitions, so as to vitalize the exhibiting functions of the NSTM and make the NSTM a venue for displaying the industrial achievement of Taiwan as well as permanent establishment to record important industrial achievement.

(3) To develop new teaching aids and combine resources from businesses, schools and society to organize more activities for technology education.

(4) To enhance public services, utilize the power of the media as well as community resources and establish a diversified marketing strategy to increase the number of visitors.

(5) To strengthen public safety around the museum and create quality visiting environment for better service.

(6) To promote automation of administration affairs of the museum and provide life-long learning access on the Internet.

(7) To improve and enrich network hardware and software equipment to enhance work efficiency.

(8) To plan a digitalized library to provide the public with information from Internet databases and to create a specialized book repository for different research topics in the museum.

(9) To strengthen cooperation among museums by holding various seminars and inviting guest speakers to improve research quality.

Business Performance

Collections and Research

As the first science and technology museum in Taiwan and the first national social education establishment in southern Taiwan, we are committed to preserving and recording the technologies, industrial artifacts, and science civilization developed by human beings. We are also committed to the research and interpretation of related artifacts and industries.

1.1 Artifact Research

In 2012, we conducted research on artifacts in the following nine themes: home electrical, TV, printing, textile, Taiwan Machinery Corporation, nanotechnology and green industries, locks, NSTM history, and ancient machinery. Apart from publishing research findings in related academic journals, we enforced collection-related businesses, including the recruitment and acquisition of industrial artifacts, artifact interpretation, and organization of collection promotion activities.

1.2 Collection Promotion

In order to display artifact research findings in front of the public, we organized 13 collection exhibitions in 2012 in the following themes: wooden mold crafts, liberty lottery and lottery, meridian instruments, measuring instruments, vinyl and cassettes, textile crafts, Victory Match stalk discharging machine, multimode tandem, Taiwan TV industry, and ancient Chinese locks. These exhibitions were organized for the public to better understand NSTM's efforts in artifact collection and the promotion of industrial and cultural heritage.

Measuring instruments exhibition

Lottery exhibition

1.3 Collection Statistics

In 2012, there were 219 artifacts registered in our collection, including 172 artifacts from donation, 23 artifacts from collection, 7 artifacts from purchasing, 17 artifacts from transfer, and 4 artifacts in temporary custody for Chunghwa Telecom. These artifacts are stored in different conditions based on their materials, so as to provide important science and technology artifacts with an environment for sustainable preservation.

Statistics of Collections

Year	Total	Collection	Purchase	Donation	Transfer	Accumulative annual collection	Temporary Custody
2008	194	7	1	157	29	1, 083	0
2009	78	0	27	51	0	1, 161	16
2010	162	5	0	157	0	1, 323	140
2011	151	51	14	86	0	1, 474	241
2012	219	23	7	172	17	1, 693	4

1.4 Open Storage

The Open Storage completed in 2009 is divided into three parts: “artifact storage process”, “artifact collection”, and “large artifact and inspection/maintenance”. At NSTM, we have a unique collection of nine artifacts in Taiwan, including the meridian instrument, sub-prototype of the meter, Tompkins circular knitting machine, full-scale wooden IDF model, and others. We also have a special collection of a full set of early printing machinery. The Open Storage is equipped with “visible storage”. It is a new measure integrating collection, research, display, and education functions to express the concept of “artifact storage with technology”. With onsite guided tours and artifact explanation services, the public can better understand the operation of collection and research at NSTM, and the artifact storage room behind-the-scenes becomes a space for the public to closely experience and study NSTM collections.

In 2012, to increase visitors, to strengthen collection promotion, and to vitalize storage exhibition contents were the main targets for the Open Storage. This year, we organized 13 storage promotion activities, including the Open Storage Summer Experience, Artifact Maintenance and Health Checkup, When Green Materials Meet Traditional Crafts, Happy Reunion of Amateur Collectors, and others. These activities attracted visitors from different social groups served a total of 11,636 people.

Guided tour at the Open Storage

Artiface maintemance

Artiface maintemance

1.5 Popular Science Library

The Popular Science Library, occupying an area of about 1,653m^2, is located on the first floor of the south complex. It is divided into two main sections: General Reading Area and Book Storage. In the reading area, there are periodicals, audiovisual materials, computers, and a reading space. Our book collection covers nine major popular science themes, five focus topics, and exhibition themes. There are also the child reading area, popular science comics area, and media room. In fact, it is the first popular science library in Taiwan. The library has a collection of about 40,000 volumes, and most of them are books on natural sciences and library science. There are about 100 periodicals, and most of them are about design and education. The library databases include the education database, news database, and journal and paper database.

In 2012, reading room occupancy was the key performance indicator of the Popular Science Library, with 1,500 visitors/month and 1,000 new volumes/year as the main targets. This year, the popular science organized a series of parent-child reading and education activities, guided reading workshops, guided tours for preschool groups, science show and tell, appreciation of popular science movies, and others. These activities served a total of 35,080 people.

A reading activity at the Popular Science Library.

1.6 Academic Exchange

Experts and scholars are invited to discuss appropriate topics in museology. In 2012, we organized the following two academic exchange activities:

a) On September 6, 2012, we co-organized the Technology Application to Museum Collection Management Workshop with MCN Taiwan in collaboration with National Museum of Taiwan History, with 51 participants.

b) During October 4-5, 2012, we co-organized the International Conference on Museum Governance 2012 with the following six units: NCKU Museum; the Graduate Institute of Conservation of Cultural Relics and Museology, Tainan National University of the Arts; Department of Theater Arts, National Sun Yat-Sen University; Chinese Association of Museums; and CAM Management Committee. A total of 18 papers were accepted and presented at the conference; four foreign speakers, such as Professor Gary Edson, delivered speeches; one director forum was organized; and more than 400 people attended the 2-day conference.

International Conference on Museum Governance 2012

1.7 Statistics on Research Outcomes and Publications

The research outcomes of 2012 included 36 journal papers, 28 conference papers, 5 books, 11 related publications, and participation in 20 research projects. With the concerted effort of NSTM employees, these publications have brought positive assistance in museology research.

Statistics of Research Results and Publications in 2012

Item / Year	Journal papers	Conference papers	Research projects		Academic speech	Publications					Conferences	Academic Workshops
			NTSM employees as principal investigators	NTSM employees as participants		Books	DVD	Newsletter	Leaflets	Journals		
2008	31	12	19	17	8	5	1	2	17	0	4	0
2009	23	21	16	22	24	5	0	13	6	1	5	0
2010	32	24	14	14	21	4	1	1	4	2	3	0
2011	29	27	17	6	24	2	3	1	16	2	2	28
2012	36	28	17	3	6	5	0	1	8	2	2	38

Exhibitions

In 2012, we launched a total of 31 exhibitions, refurbished one exhibition hall, and updated part of the exhibition units of three exhibition halls. We continuously maintained exhibits and implemented the quantification of business to ensure a normal maintenance rate over 91.51%. We also organized the 2012Film Festival to enhance theater operational efficiency.

2.1. Special Exhibitions

1) Ultimate 3D: The Wonder of Holographs

At the Ultimate 3D: The Wonder of Holographs, nearly 200 holographic works from the UK, Demark, and the USA were displayed. Through these statistic exhibits, the gradual development of holography from science experiment into a form of art was presented for the public to better understand the diversity of this industry. Formosa TV introduced the works from UEG ADM.APS of Demark to trial with NSTM the impact and effect of the “World Premiere in Kaohsiung”. Apart from allowing the public to understand what “holography” is, this exhibition crossing over science and art created an all-win situation for the audience, NSTM, and co-organizers. The exhibition was held during January 20 to April 22, 2012.

2) Quest for Immortality

The Quest for Immortality was co-organized by NSTM and Media Sphere Communications Ltd, with 268 exhibits borrowed from the Bolton Museum and other museums in the UK. These exhibits, spanning over 6,000 years, included complete unwrapped mummies, royal mummies, child mummies, and animal mummies, and implements from the Old Kingdom, Middle Kingdom, and New Kingdom of Egypt. The exhibition was held during March 3 to May 27, 2012.

3) Dinosaurs Dream Park

This was a big dinosaur exhibition integrating multimedia animation and popular science co-organized by NSTM and Artsource Corporation for the first time. With “sea, land, and air dinosaurs”, the exhibition presented a full picture on dinosaurs that had ruled the earth for about 200 million years. Bringing live effects and re-presenting the underwater world in the Mesozoic Era with multimedia, animation, and audiovisual effects, the Dinosaur Dream Park allowed visitors to learn about dinosaurs from playing with them, to feel how dinosaurs mambo in the water, to appreciate the beautiful feathers of primitive birds, and to learn popular science knowledge from entertainment. The exhibition was held during March 23 to June 3, 2012.

4) Theo Jansen in Taiwan

Co-organized by NSTM and C&S Creation, the Theo Jansen in Taiwan displayed the wind-driven "artificial organisms" called the Strandbeest created by heavyweight Dutch artist Theo Jansen in 1990 with used yellow plastic tubes based on science and technology knowledge and out of creativity. Apart from shaking the human senses, these huge beach beasts that do not need fuel represent the artist's concerns about the environment, and his attempt to change human dependency on energy under the pre-existing knowledge framework. A subject integrating art and science education, the stunning *Strandbeest* brought visitors an edutaining experience and unprecedented sensational education. The exhibition was held during June 21 to August 26, 2012.

Theo Jansen in Taiwan

5) Under Keys and Locks

The Under Keys and Locks introduced the evolution, principles, manufacture, and effect of locks over time across the world. The private collection of ancient Chinese locks of Vice President Hong-sen Yan of National Cheng Kung University was also displayed. More than 130 valuable ancient locks were exhibited, including fish pattern locks in multiple styles, various puzzle locks, pattern locks with 12 Chinese zodiac signs, elaborately made pattern locks, and craftily made character combination locks. The exhibition showed to the public the importance of locks and allowed them to better understand locks and daily life. The exhibition was held during 8 November 2012 to 28 February 2013.

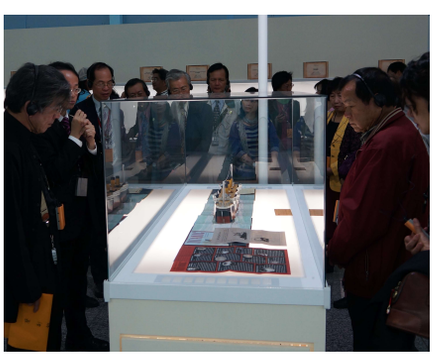
Under Keys and Locks

6) Art in the Minutia

The exhibition combined the exhibition themes of the Taipei Story House (TSH) and the Miniatures Museum of Taiwan (MMOT). With "The Story of Chinese Banknotes", visitors began to explore the History of Taiwan Banknotes and the folk customs across the world from the images on the banknotes, and to discover the history and art represented in banknotes. The Doll House and the Roombox were the main themes for the MMOT to display the characteristics of minutia. The exhibition was held during July 28 to October 21, 2012.

7) Decoding the First Emperor's Mausoleum and Silent Warriors of Ancient China

Co-organized by NSTM and Artsource Corporation, the exhibition combined the history of the Qin Dynasty, archeology, culture, creativity, and technology. With visual effect and voice recognition multimedia, visitors dialogued with the First Emperor across time and space. The exhibition is held during 17 November 2012 to 7 April 2013.



8) The Stunning Pop-Up Book

The Stunning Pop-Up Book was co-organized by NSTM and United Daily News. The history of pop-up books can be dated back to the thirteenth century. It was first created for academic purpose. After printing technology matured in the nineteenth century, games, pictures, and story pop-up books for children emerged. As pop-up books are gorgeously illustrated, paper engineering design broke the graphic limitations of books. People were thus attracted to the changeful pop-up pictures of these books. The exhibition was held during 13 December 2012 to 7 April 2013.

9) Liquor with Rich Stories: The Feast by the Winding Stream

The Liquor with Rich Stories: The Feast by the Winding Stream was co-organized by NSTM and Taiwan Tobacco & Liquor Corporation. It introduced the evolution and technological development of Taiwan's tobacco and liquor industries. It also introduced liquor culture from across the world, including how to drink healthily, taste wine, and select quality wine. The exhibition also appealed to people responsible drinking and the prevention of alcoholism. Lastly, the exhibition brought visitors to travel across the wineries in Taiwan. The exhibition was held during 28 September 2012 to 31 March 2013.

Liquor with Rich Stories: The Feast by the Wining Stream

10) Cake Town

The Cake Town was co-organized by NSTM and Choice Publishing. This educational exhibition demonstrating the craft art of cake-making was the first exhibition dedicated for cake-making. The content included the characteristics of cake across the world for visitors to explore the world cake culture. A cake in the shape of Kaohsiung's landmark was displayed. Other exhibits included the pulled sugar cake and the sugar-craft cake for visitors to appreciate the beauty of cake. The exhibition was held during 22 December 2012 to 14 April 2013.

2.2. Update of Permanent Exhibitions

1) Opening of the "Time Traveling the NSTM" Exhibition Hall

2012 marked the 15th anniversary of NSTM. In order for the public to better understand the bits and pieces behind-the-scenes of NSTM over the past 15 years, we organized the "Time Traveling the NSTM" on the 15th anniversary to show the efforts and development of NSTM and to leave a trace and heritage for the future. Valuable images and pictures in the original NSTM history archive and interactive methods were employed to present to the public the unseen aspects of NSTM. Contents presented in terms of people, events, and objects expressed the past history and present efforts and introduced the future direction of NSTM. The four exhibition zones included "Genesis", "The Making of NSTM", "Twilight Hours", and "Future Visions". Contents were the most important, the most unknown to the public, the most touching, and the most expected. The exhibition began on 1 October 2012.

Time Traveling the NSTM

2) Climate Change Exhibition Hall Update—Perpetual mission—Relieve the Earth's Burden: CSC Group Zone

Perpetual mission-Relieve the Earth's Burden: CSC Group Zone in the Climate Change Exhibition Hall opened on 27 June 2012 was planned by NSTM with China Steel Corporation and social resources. Exhibits in the zone are made with green materials to display. The overall exhibition design describes and introduces green products, green process, green partners, and green business. The zone is a venue for China Steel to demonstrate its corporate action for environmental conservation and turn NSTM into a quality venue for environmental education.

Steel Forest Interaction, CSC Group Zone, Climate Change Exhibition Hall

3) Train Model Update in the Transportation and Civilization Exhibition Hall

The Transportation and Civilization Exhibition Hall at NSTM is one of a few transportation exhibition halls in Taiwan. In order to display train models that are closer to the reality in Taiwan, we have completed a brand new set of models with the landscape based on Taiwan's railway network. These included five systems: the Western Line, Eastern Line, Alishan Line, Taiwan High Speed Railway, and five Taiwan Sugar Railways; two railway stations; one THSR station; one station of the Alishan Line; one station of the Taiwan Sugar Railways; one fan-shaped depot; and seven sets of rolling stock: the THSR train, TRA Zhichiang train, TRA Juguang train, TRA Fuhsing train, TRA Toroku train, TRA ordinary train, TRA cargo train, sugar transportation train, and Alishan forest train.

Train Model Update in Transportation and Civilization Exhibition Hall

4) Forest Roaming Update with AR in Candy House at Children's Science Center

The blue screen studio in the Forest Roaming zone of the Candy House in the Children's Science Center on B1 of NSTM was updated with the fun and interesting augmented reality (AR) for children to enjoy more wonderful experience. AR technology presents 3D virtual objects and combines them with real-time video.

Forest Roaming in the Candy House

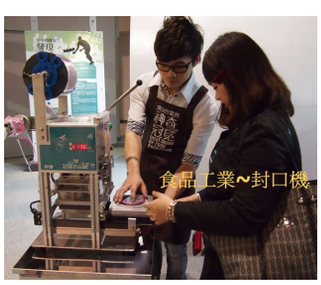
5) Typhoon Exhibition Zone Update in the Mitigation of Natural Hazards Exhibition Hall

In the end of March 2012, ten units in the Typhoon Exhibition Zone of the Mitigation of Natural Hazards Exhibition Hall were updated. Eight new exhibits were donated by the Japan Science Society. They included the "What is a Typhoon", "Typhoon Eye", "The Naming of a Typhoon", "Typhoon Observation", "Typhoon Must Come", "Typhoon Routes to Taiwan", "How to Mitigate Typhoons", and "After the Rain and Storm". These units allow the public to better understand the characteristics and functions of water, the correlations between the earth's evolution and atmospheric movements, and the phenomena brought by typhoons.

Typhoon Exhibition Zone Update in the Mitigation of Natural Hazards Hall

6) Great Crown of Food Packaging Zone in the Food Industry Exhibition Hall Update

The Food Industry Exhibition Hall has been updated lately by adding the Food Packaging Zone. The zone introduces the history and development of food packaging and the safety and hygiene of food packaging. In the zone, a common food packaging tool, a cup sealing machine, was exhibited to introduce how small and medium enterprises in Taiwan solved problems in technology innovation and improvement to provide citizens with more convenient life.



Food Industry—Cup Sealing Machine

2.3. Other Major Achievements

1) The Apollo Solar Car Exhibition

Making full use of science and technology resources and location advantage, enforcing "environmental technology education", and deepening the energy conservation and carbon reduction energy of green technology, NSTM specifically launched the Apollo Solar Car Exhibition in collaboration with the National Kaohsiung University of Applied Sciences for the public to learn about the history of solar car development in Taiwan, its technology principles, and future prospects; to better understand the application of solar energy; and to further arouse the student's interest in green energy, so as to cultivate future green technology talents and to promote the development of green and renewable energy industries in Taiwan. The exhibition ended on 14 December 2012.

2) Hydrogen Energy Safety Education Exhibition

Under the supervision of the Bureau of Energy, MOEA, and ITRI, the Hydrogen Energy Safety Education Exhibition was co-organized by the Chung-Hua Institution for Economic Research, National Kaohsiung University of Applied Sciences, and NSTM during September 8-15, 2012. The exhibition introduced hydrogen safety knowledge in simple and interesting ways for the pubic to understand the safety of hydrogen use and the applicability of fuel cells in daily life. This exhibition allowed the public to better understand hydrogen safety and this new green energy.

Hydrogen Energy Safety Education Exhibition

3) Ancient Animal AR Exhibition

The Ancient Animal AR Exhibition was co-organized by NSTM and the Tree Valley Life Science Museum. The exhibition was presented with the most attractive augmented reality (AR) technology from Tree Valley Life Science Museum. By combining this interactive learning technology with large interactive display, fans could travel across time and space back to the ancient times to shake hands and hug with such ancient animals as dinosaurs and mammoths, and even took pictures with them. The exhibition was held during November 14 to December 30, 2012.

4) Description of Wind Power Exhibition

Based on the atmospheric conditions and natural wind direction of NSTM, the Description of Wind Power Exhibition was held at the corridor in front of the entrance of the administrative area on the 1st floor. At the exhibition, the principles of wind power generation were demonstrated with the world's smallest micro wind turbine and the natural wind field at NSTM. This exhibition, demonstrating the implications of situated education, received lots of feedback during the exhibition period.

5) Experience Facility: Convenient Service with Automatic Ticket Vending Machines

NSTM equipped various experience facilities in the exhibition halls, including the Rainstorm House, Flying House, Moon Walk, Earthquake House, Hydrogen Cell Mini Train, LOHAS Energy Conservation House, Open Storage, Self Portrait Machine, and others, in total 12 items. These facilities emphasizing edutainment allow the public to experience science and technology theories through personal experience. Apart from selling tickets at the ticket office on the 1st floor, we purchased four automatic ticket vending machines in 2012 and installed them near the experience facilities to provide the public with more convenience service.

Automatic Ticket Vending Machine for convenient service.

6) Reducing IMAX® 3D Theatre failures with the Maintenance SOP

NSTM reinforces the training and education of projection personnel to improve their professional competence and skills and to ensure that the IMAX® 3D Theatre Maintenance Standard Operating Procedure is implemented to prevent failures. In 2012, this policy effectively reached zero failure and maintained a clean system failure record. In the absence of emergency repair by foreign specialists, all films were projected smoothly to ensure the viewing quality of audiences.

7) Ensuring Equipment Operation through Periodic Inspection and Review

With the periodic inspection of maintenance personnel and maintenance volunteers, and the professional service of outsourced providers, the Earthquake House, Moon Walk, Flying House, and Rainstorm House were inspected, maintained, and reviewed in accordance with the standard operating procedure to effectively improve system availability and stability and thereby assure the safety and service quality for visitors.

Inspection and maintenance of the Rainstorm House.

Inspection and maintenance of the Hydrogen Cell Mini Train

8) Strengthening the Planning and Implementation Competence of Self-Planned Exhibitions

The Art in the Minutia was planned by the NSTM. Maintenance and design personnel independently planned and designed the electricity layout for lighting and installation of the wooden partition of the venue based on the exhibition contents. Also, they installed the audiovisual, computer, and stereo equipment with existing resources and supervised the carpentry works based on the lighting and electricity plans. Maintenance volunteers assisted in modifying socket wiring. The Secretary Office arranged electricity and water supply contractors to support electrical devices. With their concerted efforts, the exhibition was held as scheduled. This exhibition thus allowed the NSTM maintenance personnel to improve their exhibition planning competence.

Let us make it together.

Maintenance and design personnel worked overnight for the Art in the Minutia

9) Addition of Air Pressure and Conservation of Angular Momentum Experience Units in the Mitigation of Natural Hazards Exhibition Hall

The Air Pressure and Conservation of Angular Momentum experience units were donated by the Japan Science Society and installed by NSTM in the Mitigation of Natural Hazards Exhibition Hall on the 2nd floor for the public to experience the changes in atmospheric pressure and thereby understand what storm surge is and feel why wind becomes stronger as the typhoon eye approaches.

Air Pressure Generator

Conservation of Angular Momentum

10) Summer Film Festival 2012

In summer 2012, we borrowed seven 3D movies on different themes from home and abroad to attract audiences of different age groups. These movies were broadcast 200 times for 15,379 audience members. Based on the survey and box office in 2012, we have planned to rent another two movies for 2013.

Science Education

1) Life Science Series Activities

Based on the core concept of "science for life and life with science." we launched various science education activities, including the Winter and Summer Science Camps featuring biology, machinery, nanotechnology, electricity, light, wave, magnetism, chemistry, flying, and Lego; the Weekend Fun with Science training courses; the NSTM Fun Learning hands-on activities, onsite science demonstrations, and onsite activities and training programs supporting permanent and special exhibitions. In 2012, we organized a total of 2,671 activities which attracted 289,314 visitors.

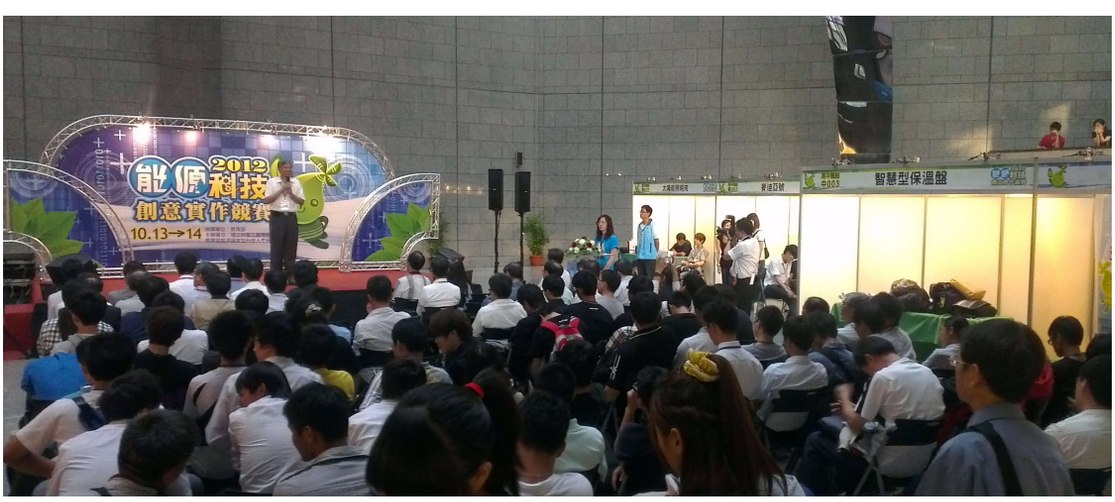
2) Children's Science Center Science Education Activities

In 2012, we also organized 207 activities for 6,202 preschoolers. These included "Egypt Exploration." in coordination with the Quest for Immortality Exhibition for preschoolers to experience the culture and technology of ancient civilization through multiple sensory training. We also planned and organized the Typhoon Is Coming activity with the apparatus in our Typhoon House for preschoolers to learn typhoon knowledge and understand typhoon mitigation, measures. The Concerns for Rural Preschoolers: Hope Engineering was a science experience camp organized on commission of the Education Bureau of the Kaohsiung City Government to arrange various science games and interactive exhibits for preschoolers in rural areas to feel the magic and fun of science with our science education resources.

Preschool groups visiting NSTM.

3) Energy Conservation and Carbon Reduction Promotion Activities

To support the national energy education promotion policy, in 2012 we organized the Energy Science & Technology Creative Design Contest and the Exhibition of MOE Energy Education Program in collaboration with the MOE Energy Education Program Office. These included organizing the Energy Science & Technology Creative Design Contest, Energy Science & Technology Teaching Activity Design Contest, the exhibition of these two events, the Exhibition of MOE Energy Education Program, and energy education grounding activities. We served more than 15,000 people in these events. The overall outcomes included the digitization and archival of award-winning works, editing the outcome handbooks and DVDs, sharing them with all energy science and technology educational resource and promotion centers, and notifying all K-12 energy science and technology education promotion centers, so as to increase the effectiveness of these outcomes. In addition, we organized the LOHAS Workshop for teacher and student training with the promotion activities of the LOHAS Energy Conservation House; the Energy Conservation Volunteer Training and Education; Green Picture Book; Green Science for Daily Life and Environment Protection; Energy Conservation, Carbon Reduction, and Green Life Workshop; STUT Solar Model Car Parent-Child Camp 2012; Solar Generation; Solar Car Dynamic Demonstration; and Exhibition of the Award-Winning Works of the Motech Award Creative Competition Using Solar Cell. In 2012, we organized a total of 204 related events which attracted 59,612 people.



Energy Science & Technology Creative Design Contest

4) Concerns for Rural Areas: Extension of Science Education

In order to plant the seed of science and technology education in rural campuses, we applied for the 3-year subsidization to the National Science Council to organize the Rural Science Experiment Stations in Developing Teaching Tools and Promotion Plan since 2010. In 2012, we established seven science experiment stations in Chiayi County, Kaohsiung City, Pingtung County, and Taitung County; and organized 18 training programs for 564 instructors and student instructors. Through open visit by appointment for nearby schools, these seven mobile science experiment stations served more than 4,300 students and teachers from 74 schools. During summer break, we organized one science and technology education camp for 62 students.

Opening ceremony of the mobile science experiment station in Fuyuan Elementary School, Taitung County

5) Nanotechnology Promotion Activity

In 2012, we continued to participate in the Nanotechnology Promotion Platform and Nanotechnology Digital Platform projects under the Nanotechnology Education & Training Project of the National Science Council, to promote nanotechnology education in different ways. The contents included the planning and implementation of the nanotechnology exhibition zone, organization of the Nanotechnology Carnival 2012, the update and operation of the Nano World website, digitization of nanotechnology science education activities, nanotechnology teaching tool R&D and demonstrations, hands-on experiments, teacher training and nanotechnology training camps for the public to understand and experience nanotechnology and improve their nanotechnology literacy through different ways of participation and learning. In 2012, we organized a 89 nanotechnology promotion activities which attracted 19,889 people.

Demonstration of nanotechnology education achievements at the Nanotechnology Carnival 2012

6) Environmental Education Promotion Activities

After the Environmental Education Act was passed, in order to coordinate with related policies and promote a green museum concept, we acguired the Environmental Education Facility and Field Certification in May 2012 to become the first certified museum for environmental education in Taiwan. In addition, we equipped three certified environmental education personnel to promote environmental education at NSTM, hoping to promote environmental education to the public through the education and demonstration. In 2012, we launched the "Knowing the Sources of Drinking Water" and "Little Energy Conservation Sentinel" programs combining fieldtrips for elementary schools and the Social Environmental Education program for adults. In order to extend environmental education to society, we organized a total of 71 promotion activities which attracted 7,374 people in collaboration with such private external resources as the Ministry of Education, Water Resources Agency, Han Lin Cultural and Education Foundation, and China Steel Corporation Group Education Foundation. These activities included the Environment Citizen Day, 518 International Museum Day: Earth-Homeland-Green Museum, NSTM Environmental Education Trip: Environmental Education Go, Go, Go, Exhibition for Water Source Conservation Community Building Achievements, and Environmental Education Tour.

China Steel Environmental Education Bus Unveiling Press Conference: Unveiling Ceremony

7) A Summer Camp of Mechanics Contest for Senior High School Students from Both Sides of the Strait

In 2004, we began organizing the Mechanics Contest for Domestics Senior High School Students and A Summer Camp of Mechanics Contest for Senior High School Students from Both Sides of the Taiwan Strait on commission of the Society of Theoretical and Applied Mechanics of the Republic of China. In 2012, the cross-strait mechanics contest was held at National Central University. There were 30 students representing Taiwan and 30 teachers and students representing China in the exchange and contest. The effectiveness of the Exchange Event of Mechanics and the mechanics contest was significant. NSTM has organized these events for 9 years. For continuation of the experience and cultivating fellow organizers, the contest will be organized by the National Center for High-Performance Computing since 2013.

8) Education Promotion Activities for Specific Age Groups (including old age group)

To show concern for students from minority groups, we planned the "Science Everywhere" project to apply for funding to Shui-Lai Chen Foundation, so as to provide science education service for students living in remote areas and from immigrant families. In 2012, the project served 38 schools and benefited 1,780 students. This year, we also promoted science education to 3,297 elderly people through 25 activities. In coordination with the Quest for Immortality Exhibition, we produced Egyptian amulets for grandparents and grandchildren to show concern for each other. We also arranged the digital camera course for elderly people to combine technology with daily life based on their actual needs.

9) Meeting the Scientists on Sunday Science Lecture Series

In order to promote science education to the public, the National Science Council began subsidizing National Cheng Kung University, NSTM, the National Kaohsiung University of Applied Science, and the National Center for High-Performance Computing to co-organize the Meeting the Scientists on Sunday Science Lecture Series. In 2012, we organized 12 lectures for 3,550 people at the International Convention Room on the 12th floor, South Wing. We also concurrently webcast these lectures for citizens at home and abroad to listen to these lectures even they could not attend them.

10) Motech Award–Creative Design Competition Using Solar Cell

We organized the Motech Award–Creative Design Competition Using Solar Cell in collaboration with Motech Industries, Inc. to encourage college students to make innovation for PV applications. 2012 was the third year of the event. On May 27, 200 faculty members and students from 39 teams participated in the final. The review was based on the proposal and model presented by these teams. The gold, silver, and bronze medalist and other awards were selected on that day.

Motech Award–Creative Design Competition Using Solar Cell Ceremony

11) Paper Airplane Flying Competition

To commemorate the invention of the first powered aircraft in human history by the Wright brothers and to promote aerospace knowledge, we organized the 2nd Paper Airplane Flying Competition for junior and senior high school students during December 15-16, 2012. All contestants made their airplane on the event day on the site. The competition included straight line flying and sliding. Creative thinking and the principles of flying were combined in the competition to develop the design, thinking, and problem-solving abilities of students. The event attracted 410 teachers and students from 89 senior high school teams and 120 junior high school teams.

Statistics of Science Education Activities 2012

Type	Workshop	Training	Field	Outdoor	Others	Total
Sessions	42	956	1557	114	2	2671
Participants	5414	34407	204644	43187	1662	289314

Visitor Services

4.1. Strengthening Marketing and Service to Enhance Visiting Rate

The visitor count is one of the operating indicators and an important performance target of NSTM. Facing the changing environment, apart from continuously updating and innovating products, we diversified marketing channels to combine with social and private resources, so as to aggressively cultivate potential visitors and minority groups. We also improved service quality through the telephone etiquette test with Kaohsiung Museum of Fine Arts and the test of professional mystery shoppers. We continuously retained basic customers by connecting with neighbors through a sound interaction mechanism. In 2012, the overall customer satisfaction score was 95 points and the total number of visitors was 2,518,651 people, an increase of 22.8% from last year.

Visitor Statistics 2008-2012

YEAR	Exhibition Hall	IMAX® 3D Theater	Charged Temporary Exhibitions	South Wing	Others	Outdoor Activities	Total Visitors
2008	509, 548	156, 462	70, 486	224, 394	417, 484	206, 321	1, 584, 695
2009	533, 509	147, 606	99, 339	225, 491	184, 985	119, 021	1, 309, 951
2010	665, 992	164, 627	260, 418	194, 747	444, 277	130, 949	1, 861, 010
2011	672, 493	159, 299	386, 860	136, 274	558, 343	137, 521	2, 050, 790
2012	1, 015, 065	180, 570	416, 380	121, 356	519, 578	265, 702	2, 518, 651

Others: Experience activities, Open Storage, LOHAS Energy Conservation House, NSTM Library, and outdoor services.

4.2. Expanding Marketing Channels with Media Resources

By holding press conferences, releasing press releases, participating in media programs, and SMS, we transmitted information regarding various exhibitions, activities, and major events to the public, so as to extend NSTM awareness and establish good public relations with the media. In 2012, we were covered in 1,369 printed media reports; published 326 articles in 52 issues of e-news; produced 52 sessions of NSTM Fun Learning and 11 sessions of Urban Life Report with National Education Radio, and 7 sessions of Kaohsiung People with Kaohsiung Broadcasting Station; and published 2 articles in the publications of Kaohsiung Tourism Association.

4.3. Real-Time Information Update through Online Communities

With the rise of online communities, we established the NSTM Facebook Fan Group at http://www.facebook.com/ilovenstm in October 2009 to meet the trend of internet marketing and to publicize NSTM education contents in a way closer to the public life. By 31 December 2012, there were 7,953 people joining the group and 141,177 people checked in. Through online communities, we distributed information about NSTM events and activities in text and multimedia, including permanent exhibitions, special exhibitions, science education activities, collection highlights, and training courses and workshops. We also distributed information about new discovery in science, environmental education, and science education, hoping to spread applied science and the green museum vision in an edutaining way.

4.4. Cultivating Customer Sources through Cross-Industry Integration

We launched tour packages in collaboration with tourism hotels and travel agents to attract tourists and students on graduation trip. In 2012, we collaborated with 13 hotels to give free tickets for accommodations. The total ticket income was NT$65,640. We also teamed up with travel agents to attract tourists. By the end of 2012, 48 travel agents signed a caoperation conteract with us.

4.5 Enriching the Visit Experience with Quality Guided Tour Service

We introduced a guided tour service in coordination with exhibitions held at NSTM. Our comprehensive guided tour service included group guided tour services and special exhibition guided tour services. In 2012, we provided "fixed time and fixed point" guided services for the following 10 special exhibitions: Technologies of the Future, A Classic Art Exhibition, Quest for Immortality, Dinosaurs Dream Park, Art in the Minutia, Liquor with Rich Stories: The Feast by the Winding Stream, Under Keys and Locks, Decoding the First Emperor's Mausoleum and Silent Worriers of Ancient China, The Stunning Pop-Up Book, and Cake Town. Overall, we provided 1,473 sessions of guided tour for 176,474 visitors.

4.6. Combining Technology with Art at Weekend Art Feast

To combine art, humanities and technology, and enhance the quality of performing art and art literacy in southern Taiwan, we organized performing activities on holidays for citizens to enjoy musical and dramatic performances while visiting our technology exhibitions. In doing so, we aimed at bringing art education to daily life and rich the intellectual and spiritual life of citizens. In 2012, we organized 7 "Weekend Art Fests" which attracted 3,150 visitors. In August, we teamed up with the Golden Love River Busker Association for weekend busker performance, which attracted 1,311 audiences.

Special exhibition guided tour (Art of the Minutia)

4.7. Supporting Minority Groups with Social Resources

We accepted corporate and non-corporate resources to support free admission for children from minority groups, hoping this could effectively increase NSTM incomes and the visit rate and enforce the science education and social concern responsibility of museum. In 2012, we continued the Children's Charity Program, whereby sponsors, including Chunghwa Telecom, Y-Fang Sealing Machine LTD, China Steel Caring Club, Kaohsiung City Children's Charity Group, Kaohsiung Instrument Commercial Association, and Kaohsiung Architects Association sponsored a total of NT$725,386 for the admission of 2,432 children from minority groups, which was 80% increased, when compared with 2011. In addition, we arranged a massage service by visually impaired people in collaboration with the Labor Affairs Bureau of Kaohsiung City Government. The service served a total of 1,208 visitors.

4.8. Aboriginal Learning Project for Parent-Child Science Education

To show concern for aboriginal students and families, we implemented the Lifelong Learning Together: From Communities to Museums 2011 subsidized by the Ministry of Education for schools in aboriginal communities in Kaohsiung city, Pingtung County, and Taitung County. In addition to various lifelong learning activities, we inspired the science and knowledge learning interest of aboriginal students with parent-child interactive learning and science experience through in-depth guided tour for exhibitions, science adventure games, and 3D movies. During December 2011 to 2 May 2012, we provided services for 2,529 teachers, students, and parents from 29 senior and junior high schools in aboriginal communities.

4.9. Enhancing Overall Operational Performance with Human Resources from Society

As the spatially largest museum in Taiwan but with limited staffing, we recruited volunteers from society to join our service team in accordance with the Volunteer Service Act. The scope of services included exhibition maintenance, experience facility service, theater service, collection maintenance, collection documentation, collection research, collection management, reader service, education activities, publicity, audience service, guided tour and docent service, nursing, administration, gardening and landscaping, and general affairs. By the end of 2012, there were 1,078 volunteers and 176,546 hours of services, 212 voluntees participated in 3 volunteer symposiums and 640 volunteers jointed the volunteer commendation ceremony. To express gratitude for senior volunteers, we presented awards to 83 volunteers who have been working with NSTM for 15 years (and 2,250 hours of serrice) at the 15th anniversary celebration.

In 2012, we assisted in establishing the NSTM Volunteer Fund, with volunteer donations and incomes from the Sunday Flea Market at the hallway of our souvenir center as the fund sources. Apart from the cash gift, consolation fee, and tour subsidy for volunteers, part of the fund was donated to charity. In 2012, the balance was NT$195,636.

15th Anniversary Celebration

4.10. Developing Sound Community Relations with Friendly Neighbor Activities

Through these activities, we provided citizens in nearby communities with access to museum resources. In 2012, we organized the following friendly neighbor activities:

1) 2 sessions of movie test screening were organized: March 10-18, 2012, attracted 2,840 local people; and September 15-23, 2012, attracted 2,037 locals.
2) NSTM Happy Learning: 19 May 2012, attracted 2,000 locals.

4.11. Creating Comfortable Environment for Breastfeeding

In order to provide visitors with a comfortable and private breastfeeding environment, and to maintain woman's right to breastfeed in public areas to improve the quality of public service, we re-planned and remodeled the nursing room in November 2011. The brand nursing room is private, warm and comfortable, and we provide diapers, wipes, and breast milk storage bags for mothers and their babies.

In 2012, the nursing room was used by 1,403 mothers, the number was 775 increased over 2011. Service satisfaction was 97.8%, which was 18% higher than in 2011. Our nursing room also won the Most Comfortable Environment Award in the "As You Wish: Welcome to Breastfeed Your Baby" Nursing Room Competition organized by Kaohsiung Government.

4.12. Extending Museum Education with the NSTM Green Shop

NSTM Green Shop, the feature shop of NSTM, opened on December 28, 2012. It expresses our belief in "Green Action for a Green Museum" based on our vision: Science for Life and Life with Science. Products sold in the shop are related to green, energy-savings, environmental protection, science, and education subjects. With these products, we hope to disseminate our vision and belief and extend our educational belief: Green Life with Green Action.

The grand opening of the Green Shop on December 28, 2012

Green Museum Plan

In terms of the following four aspects: sustainable environment, sustainable economy, sustainable culture, and sustainable society, in 2012 we continued to promote the "Green Museum" vision through green action based on our core vision "Science for Life and Life with Technology" for sustainable development. In practice, we were committed to building a friendly and comfortable environment for visitors, promoting multiple participation and social responsibility, encouraging cultural heritage and innovation, and improving cost control and financial optimization. The status and outcomes of implementation in individual aspects in 2012 are described below.

5.1. Sustainable Environment

The aim of sustainable environment is to develop NSTM into a friendly, comfortable, and happy environment for visitors. In implementation, it includes three main issues: energy conservation and carbon reduction, environment management, and green consumption. There were seven sub-projects, including the renewable energy utilization project, energy conservation improvement project, green building improvement project, green building material project, building green landscape project, strengthening green purchasing project, and green shop operation project.

Major project outcomes in 2012 included: Total annual electricity consumption reduced 343,543 kWh, which was 2.57% less than the same period in previous year. This included hallway lighting energy saving up to 87.5%. When participating in the Four Saving Projects Competition, we won the third prize in the Innovative Application Award for the Smart Energy Saving Techniques with Environment item from more than 7,000 contesting agencies and schools. In addition, we received a grant of NT$2 million from the Architecture and Building Institute to upgrade the air-conditioning system into the full ice storage air-conditioning system. We also reduced water consumption by 2,020m3 (by the end of November, which was 2.92% less than the same period in previous year) by reinforcing water leaking prevention and water saving. The green purchasing percentage also increased to more than 99%. Most importantly, the Green Shop officially opened on 28 December 2012.

5.2. Sustainable Society

The aim of sustainable society is to fulfill our society responsibility, to pursue social justice, and to extend the opportunities for participation, so as to win the recognition and support of visitors, communities, and museums at home and abroad. In implementation, it included three main issues: improvement of education and services for plural ethnicity, promotion of community relations and development, and promotion of multicultural and international cooperation. The four sub-projects included the major visitor expansion project, potential visitor cultivation project, community friendship co-prosperity project, and domestic and international exchange and cooperation project.

Major project outcomes in 2012 included: Service for 2,489,790 people, which was 439,000 people, or 21.4%, more than in 2011. In domestic and international exchange and cooperation, we organized one international conference on museology, participated in seven professional museum organizations at home and abroad, visited five foreign museums and related organizations, and established four mechanisms for domestic and international exchange and cooperation.

5.3. Sustainable Culture

The aim of sustainable culture is to reinforce cultural heritage and innovation through collection research, exhibitions, and education activities. In implementation, it includes three main issues: cultural asset preservation, green education, and green exhibition. The three sub-projects included collection and research improvement project, green education promotion project, and green exhibition and assessment project.

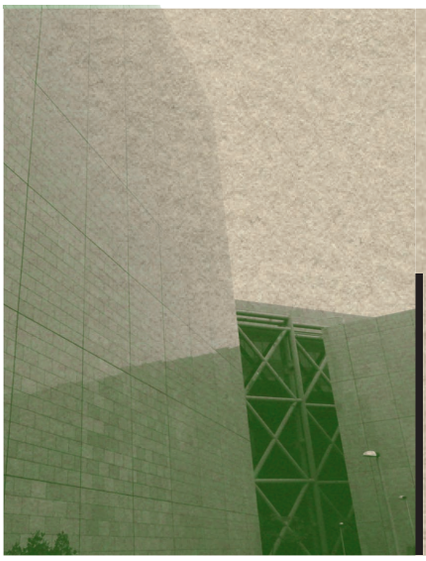
Major project outcomes included: 219 science and technology artifacts were collected and 13 collection promotion and artifact preservation activities were organized for cultural asset preservation. In green education promotion, 34 activities and exhibitions for promoting energy conservation and carbon reduction were organized, with more than 23,000 participants. We also passed the Environmental Education Facility and Field Certification and organized 26 activities to promote environmental education, with more than

900 participants. In addition, we continuously organized activities to promote science education to minority groups. Apart from establishing three science experiment stations in 21 rural schools for 1,561 teachers and students, we organized 50 popular science activities for minority groups which attracted about 2,100 people. In green exhibition, we organized five exhibitions with contents on environmental protection and energy conservation. We also examine the environmental protection effectiveness of exhibits with the green exhibition checklist.

5.4. Sustainable Economy

The aim of sustainable economy is to control cost, reduce operational cost, and optimize financial mechanisms. In implementation, it included two issues: resource recycling and utilization of external resources. The two sub-projects included the resource recycling project and cutting expenses and increasing sources project.

Major project outcomes included: Office waste reduced by 2% and resource recycling increased by 2% for resource recycling. In cutting expenses and increasing sources, we increased sales and sales income amounted to NT$73,214,326, which was NT$3,427,751, or 4.91%, more than NT$69,786,575 in 2011. Recurrent expenses reduced NT$138,524,950, which was NT$3,298,007, or 2.33%, less than NT$141,822,957 in 2011.



General Affairs and Environment

6.1. General Affairs

6.1.1. Saving budget through opening tendering

In 2012, a total of 67 contracts each worth more than NT$100,000 were tendered. The accumulative tendering budget was NT$88,082,603, the awarded amount was NT$79,221,109, and a total of NT$8,861,494, or 10.06%, was saved. A total of 357 procurement contracts each worth between NT$10,000-100,000 were tendered . The accumulative tendering budget was NT$12,723,623, the quotation amount was NT$12,030,998, and a total of NT$692,625, or 5.44%, was saved.

6.1.2. Increasing sources with income from interest

We revolutionized past practice by increasing the number of small-amount time-deposit contracts and raising the deposit space. In 2012, the income from interest was NT$1,796,486, increased 36% of 2011.

6.1.3. Promoting file management for proper retention

In April 2012, we completed and implemented the online document approval and file management systems to digitize documents and to set a foundation for the document digitization and e-document database of NSTM. We also continued with document destruction and held the document appraisal team meeting. After destroying more than 12,000 documents, we saved much space in the storage room. Also, the retrospection of all documents was completed.

6.2 . Electrical and Mechanical

6.2.1. Enforcing green museum through saving water, electricity, oil, and paper

In 2012, we continued the equipment improvement and energy conservation measures. The total electricity consumption was 13,037,257kWh, which was 343,543kWh, or 2.57%, less than 13,380,800kWh in 2011. We also enforced the pipeline leaking inspection system (no need to purchase any water-saving equipment). The water consumption from January to December was 71,982m^3, which was 567m^3, or 0.78%, less than 72,549m^3 in the same period of 2011. In order to achieve the 3% less oil consumption for museum cars, we maintained a record every month in a form for the reference of museum car users. We also promoted e-document approval in coordination with related policies. From April to December, about 30,000 sheets of paper were reduced to effectively save paper consumption.

6.2.2. Exercise for emergencies

In 2012, we organized one flood prevention exercise to improve the emergency responsiveness of electrical and mechanical personnel and facility suppliers. We also organized two self-defense fire taskforce training to improve the fire equipment operation skills and disaster handling skills of employees.

6.2.3. Promoting resource recycling for environmental protection

We continue to promote the “Go! LOHAS NSTM” activity. In 2012, we extended environmental protection in daily life to environmental health and living safety. Teaming up with the Taiwan (Kaohsiung) Consumer Protection Association, we planned the outdoor organic farmer marketplace 24 times to serve about 8,895 farmers, so as to provide a direct trading venue for farmers and consumers.

6.2.4. Awards and honors

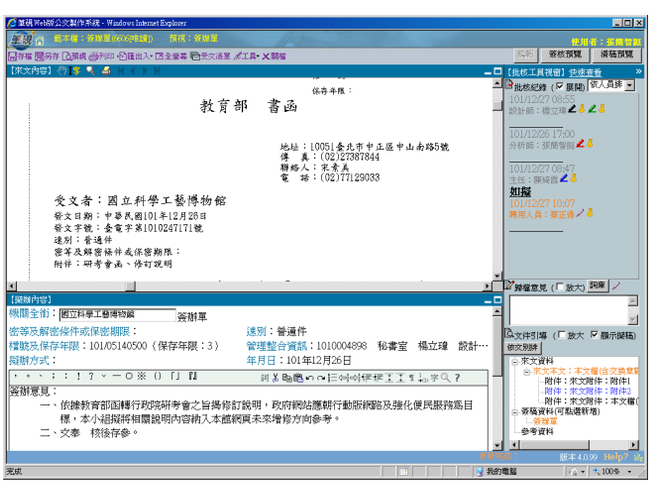
In 2012, we won the 4th Government Service Quality Award from the Executive Yuan; rated second of the fund utilization or business category in The Plans for Strengthening the Management and Utilization of National Property; won the third prize of the Innovative Application Award in the Four Aspects of Reduction Project in Authorities and Schools 2011 from the Executive Yuan; and the outstanding performance individual award in water saving in the Outstanding Water Saving Agency and Individual Selection 2012 of the Water Resources Agency.

6.3. IT

6.3.1. Completing the online document approval system

To coordinate with the Plan to Promote the Use of Electronic Official Documents to Reduce Paper Consumption and Save Energy of the Ministry of Education and the Executive Yuan, we began planning the e-document approval system in 2011, hoping to reduce paper consumption and enhance administrative efficiency with e-document approval. The e-document approval system officially went live on 1 April 2012. The system covered the e-operation of inbound documents, document drafts, comment for documents, and document filing. The citizen digital certificate was used for document approval. Document management, document approval, document exchange, and file management functions were integrated into one single system to significantly reduce the time for document delivery, drafting, and approval. Major project outcomes include:

1) 71% e-document rate: 100% e-document approval has been applied in NSTM. Paper documents are scanned for e-approval to significantly reduce paper consumption. The reduction rate is 41%, which is higher than the 30% specified by the Executive Yuan. Estimates show that about 40,000 sheets of paper were saved.
2) Enhancement of administrative efficiency—average document approval time at 1.61 days: E-document approval has significantly reduced manual document exchange time to reduce document management and drafting time to 1.25 days.
3) E-document and e-file management: Combined with the original document imaging system, documents are digitized for file management to reduce storage space and allow employees to access the required documents more efficiently.



6.3.2. Cloud computing for server virtualization

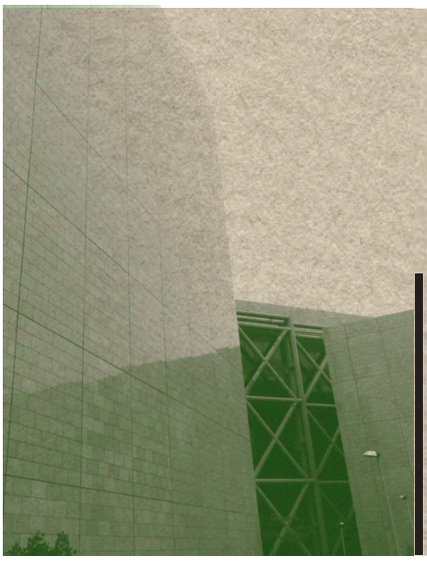
Continuing the virtual server implementation plan in 2011, we completed the NSTM virtual server expansion project in 2012, including the virtualization of four servers: science education registration system, database system, web server, and document backup server. Apart from reducing server replacement and maintenance expenses, the project has reduced energy consumption and saved server purchasing budget at about NT$700,000.

6.3.3. Enhancing information security

In 2012, we updated the mail server and antivirus software to enhance the computer virus and spam identification ability of the NSTM IT system to reduce the opportunities of information security incidents. We also held two information security management review meetings and conducted one internal information security audit to review and audit the personal information management of employees. We organized the information security management and personal information protection training programs for the e-document approval system.

6.3.4. Self-development and maintenance of IT systems

We independently developed a number of IT systems, including the social service system, exhibition hall inspection system, electrical and mechanical spare part management and enquiry system, collection research registration system, membership card application system, volunteer shift enquiry system, attendance system adjustment, suggestion for minister system, survey system, and other maintenance modules.



Fund Utilization

7.1. Annual Incomes and Expenses

In FY 2012, the total incomes of NSTM was NT$335,750,000. The major income sources included NT$221,324,000 from the subsidy for the development of social education Institutes, representing 65.92% of the total; and self-raised fund of NT$114,426,000, representing 34.08% of the total. Among all sources of self-raised funds, the income from museum services of NT$39,461,000 was the highest, representing 11.75%; the income from cooperative education at NT$28,221,000 was the second highest, representing 8.41%; the income from assets and royalties at NT$20,131,000 was the third highest, representing 6.00%; the income from continuing education of NT$10,157,000 was the fourth highest, representing 3.02%. The other incomes were 16,456,000, representing 4.90%. In FY 2012, the operating cost and expense was NT$419,172,000, representing 124.85% of the total incomes. Therefore, the shortage for 2012 was NT$83,422,000. This is the result of the regulatory amortization and depreciation of the operations fund. In terms of incomes, the ratio of self-raised fund was 34.08% in 2012.

Fund Utilization

Financial Statement of Income, Expense, and Shortage for 2012

(expressed in NT$1,000)

Title	Budget of the Year	Final Account of the Year	Final Account of the Previous Year
	Amount	Amount	Amount
Operating Income	307, 710	312, 283	319, 716
Service Income	28, 000	39, 461	32, 985
Exhibition Halls	15, 550	12, 924	15, 890
Theater	12, 450	13, 127	11, 394
General Exhibitions		10, 016	5, 701
Experience facility		3, 394	
Cooperative Education Income	50, 296	28, 221	27, 030
Continuing Education Income	8, 090	10, 157	12, 926
Income from the Subsidy for the Development of Social Education Institutes (A)	221, 324	221, 324	231, 045
Other Subsidy	0	13, 120	15, 730
Non-operating Income	22, 803	23, 467	23, 875
Interest	800	1, 800	1, 332
Asset Use and Royalties	21, 400	20, 131	21, 507
Donated income		37	
Breach Penalty (including compensations)	50	438	41
Miscellaneous	553	1, 061	995
Total Incomes (B)	330, 513	335, 750	343, 591
Operating Cost and Expense	451, 713	419, 172	419, 106
Service Cost	232, 329	228, 926	237, 050
Cooperative Education Cost	44, 488	25, 896	22, 185
Continuing Education Cost	6, 090	4, 311	4, 226
Managerial Fee and General Affairs	168, 806	160, 039	155, 645
Total Expense	451, 713	419, 172	419, 106
Balance (Shortage) of the Period	−121, 200	−83, 422	−75, 515
Proportion of Current Government Subsidy (A)/(B)	66. 96%	65. 92%	67. 24%
Proportion of Current Self-raised Fund of Organization 1-(A)/(B)	33. 04%	34. 08%	32. 76%
Income from Self-raised Fund	109, 189	114, 426	112, 546

Source: Budget plans and financial statements of all FYs. Since this year, the income from general exhibitions will be adjusted from “Incomes from Asset Use and Royalties” to “Service Incomes”.

7.2. Annual Budget and Final Accounting of Capital

The result of capital execution in 2012 was NT$18,172,000 (construction, improvement, and expansion of fixed assets), and the entire amount was disbursed with self-raised fund. The fixed asset resulting from specific subsidy programs of Ministry of Education and Ministry of Interior was NT$10,385,000. The entire fixed asset comes to NT$28,557,000.

Annual Budget and Final Accounting of Capital 2011

(expressed in NT$1,000)

Planned Title	Disbursable Budget	Final Accounts of the Year
Construction, improvement, and expansion of fixed assets	18, 892	18, 172
Government Subsidy	0	0
Self-raised Fund	18, 892	18, 172
Capital Surplus-Donated assest received	0	10, 385
Total	18, 892	28, 557

7.3. Budget and Final Accounts of Income after the Implementation of Operation Fund Over the Years.

(expressed in NT$1,000)

Item / FY	Budget					Final Accounts				
	Total	Subsidy for the development of social edution institutes	%	Self-Raised Fund	%	Total	Subsidy for the development of social edution institutes	%	Self-Raised Fund	%
2008	290, 529	222, 682	76. 65	67, 847	23. 35	339, 550	222, 682	65. 58	116, 868	34. 42
2009	292, 280	222, 552	76. 14	69, 728	23. 86	340, 319	222, 552	65. 40	117, 767	34. 60
2010	303, 024	232, 746	76. 81	70, 278	23. 19	376, 968	232, 746	61. 74	144, 222	38. 26
2011	297, 950	229, 746	77. 11	68, 204	22. 89	343, 591	231, 045	67. 24	112, 546	32. 76
2012	330, 513	221, 324	66. 96	109, 189	33. 04	335, 751	221, 324	65. 92	114, 427	34. 08

Source: Budget plans and financial statements of all FYs.

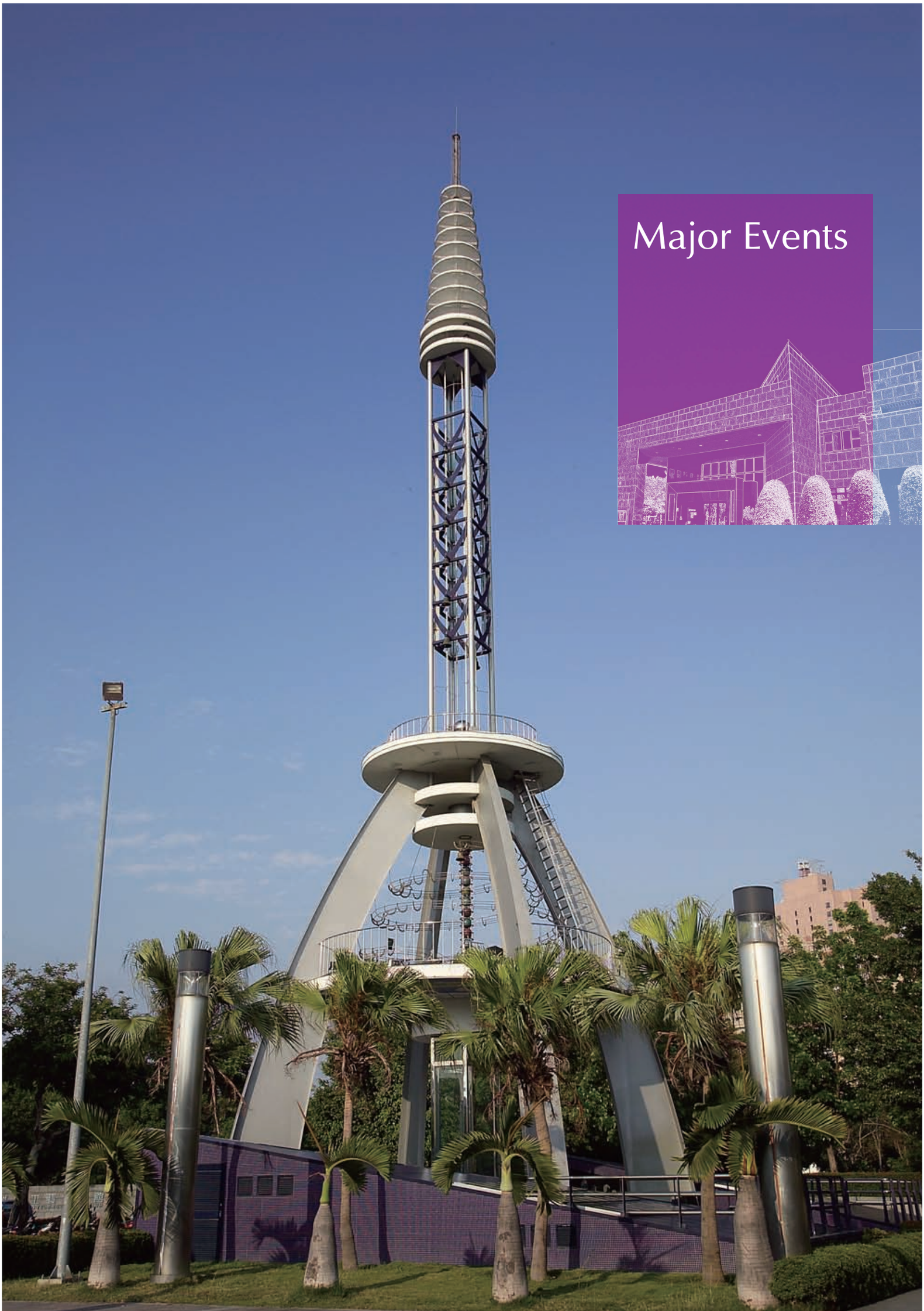
7.4. Budget and Financial Accounts of Expense after the implementation of operation fund

(expressed in NT$1,000)

Item / Year	Budget					Final Accounts					
	Total	Current Expenditure	%	Capital Expenditure	%	Total	Current Expenditure		%	Capital Expenditure	%
							Personnel Expense	Current Expenses			
2007	303, 964	285, 166	93. 82	18, 798	6. 18	534, 471	116, 781	347, 698	86. 90	69, 992	13. 10
2008	335, 070	290, 246	86. 62	44. 824	13. 38	518, 767	117, 709	344, 815	89. 16	56, 243	10. 84
2009	302, 051	291, 997	96. 67	10, 054	3. 33	551, 295	119, 405	331, 970	81. 88	99, 920	18. 12
2010	376, 828	366, 764	97. 33	10, 064	2. 67	513, 683	121, 574	331, 636	88. 23	60, 473	11. 77
2011	428, 603	418, 539	97. 65	10, 064	2. 35	432, 857	122, 749	296, 357	96. 82	13, 751	3. 18
2012	470, 605	451, 713	95. 99	18, 892	4. 01	447, 729	124, 548	294, 624	93. 62	28, 557	6. 38

Source: Budget plans and financial statements of all FYs.

Major Events



Major Events

No.	Date	Item	Event Summary	Proposing Unit
1	1/19	Exhibition	Y-Fang Sealing Machine sponsored the Food Packaging Exhibition Update Project of the Food Industry Exhibition Hall and the sealing machine DIY demonstration.	Exhibition Division
2	1/20-4/20	Exhibition	NSTM and Formosa TV co-organized the Ultimate 3D: The Wonder of the Holograph Exhibition held on the 2nd floor of the North Complex. The grand opening was held on January 20.	Exhibition Division Public Service Division
3	1/30	Activity/ Event	Lunar New Year Group Greetings 2012.	Personnel Office
4	2/1	Other	The Intellectual Property Office of the Ministry of Economic Affairs awarded the certificate of utility model patent (M421938) to Assistant Research Fellow Cheng-zhi Chen of the Technology Education Division for his R&D of Plant Evaporation Collector.	Technology Education Division
5	2/1	Other	Demonstration of the Self-Portrait Machine at the hallway on the 2nd floor in the east wing.	Exhibition Division
6	2/4	Activity/ Event	NSTM and ESUN Robot Association co-organized the robot competition Taiwan round of the 2011-2012 FLL (FIRST LEGO® League) & FTC (FIRST Tech Challenge).	Technology Education Division
7	2/11	VIP	Curator Xiejun Chen, Curator of the Shannghai Museum, took a group of delegates to visit NSTM.	Public Service Division
8	2/12	Conference	NSTM held the 50 Years of TV Industry in Taiwan Workshop at the Open Storage.	Collections and Research Division
9	2/12-4/8	Exhibition	NSTM held the Past-Present-Future: 50 Years of TV Industry in Taiwan Exhibition at the Open Storage.	Collections and Research Division
10	2/16-3/31	Other	Promotion of popular science learning resources to Chinese primary and secondary schools in Thailand (Chiang Mai and Chiang Ra) with the assistance of the Taiwan World Youth Volunteer Association.	Collections and Research Division

No.	Date	Item	Event Summary	Proposing Unit
11	2/21-5/20	Exhibition	NSTM and Yingge Ceramics Museum co-organized the National Chinese Zodiac Sign Ceramics Competition Exhibition at the Coffee Art Gallery on the 2nd floor.	Exhibition Division
12	2/26	Exhibition	100 Years of Taiwan Railway Photography Exhibition at the Art Zone on the 1st floor.	Exhibition Division
13	3/3-5/27	Exhibition	NSTM and Media Sphere Communications co-organized the Quest for Immortality on the 6th floor of the South Complex. MOE Deputy Social Education Director Tsung-yeh Hsiung, KCG Secretariat Hong-mo Wu, Pingtung Deputy Magistrate Jia-bin Zhong, and other guests were invited to the grand opening on March 2.	Exhibition Division Public Service Division
14	3/4-3/27	Exhibition	The Madame Curie Exhibition organized by Le Bureau Français de Taipei was held in the Science Laureate Hall.	Exhibition Division
15	3/6	Activity/ Event	NSTM and China Steel Corporation Group Education Foundation held the inauguration of the Environmental Education Tour at Liugui Elementary School in Kaohsiung.	Public Service Division
16	3/9-4/22	Exhibition	NSTM and ITRI co-organized the Technology Innovation Pavilion Exhibition at Cosmo Start Plaza. BOIT Director-General Ming-chi Wu, ITRI Director-General Jue-min Hsu, Marketing and Communication Director Chia-rong Lin, and Chief Shu-pei Hsu attended the opening ceremony on March 9.	Exhibition Division Public Service Division
17	3/10	Activity/ Event	NSTM organized speeches and visits for the Happy Reunion of Amateur Collectors at AB103 Briefing Room and the Open Storage.	Collections and Research Division

No.	Date	Item	Event Summary	Proposing Unit
18	3/15	Other	NSTM won the MOE Government Service Quality Award from Executive Yuan 2010. Director-General Shun-hsiang Chen received the award at the Ministry of Education.	Secretariat
19	3/18	Activity/ Event	NSTM and Taiwan (Kaohsiung) Consumer Protection Association co-organized the outdoor organic farmer marketplace and education activities for the "Go! LOHAS NSTM	Secretariat
20	3/19	Activity/ Event	To hold the Volunteer Commendation Ceremony and Dinner Party 2012.	Public Service Division
21	3/20	Other	The Japan Science Society donated the typhoon experiment apparatus it developed, designed, and built to NSTM.	Exhibition Division
22	3/24-6/3	Exhibition	NSTM and Artsource Corporation co-organized the *This was a big dinosaur* exhibition integrating multimedia animation and popular science Dream Dinosaur Park at the second and third special exhibition halls. The opening ceremony was on March 23.	Exhibition Division Public Service Division
23	4/1	Other	NSTM implemented e-document approval using the citizen digital certificate for document approval.	Secretariat
24	4/3-4/29	Exhibition	The Exhibition of the Kaohsiung City Fine Art Classes for Gifted Artists 2012 was held at the Art Zone on the 1st floor.	Exhibition Division
25	4/7	Activity/ Event	NSTM organized the Mechanics Contest for Domestics Senior High School Students 2012 on commission of the Society of Theoretical and Applied Mechanics of the Republic of China.	Technology Education Division
26	4/17-5/2	Exhibition	The Exhibition of Prosecutorial Collections organized by MOJ and sponsored by NSTM was held at the NSTM atrium.	Exhibition Division
27	4/17-4/22	Conference	NSTM attended the 2012 ASPAC Annual Congress which was held at Science Centre Singapore.	Public Service Division

No.	Date	Item	Event Summary	Proposing Unit
28	4/21-5/15	Activity/Event	NSTM organized the Art of Wooden Mold Craft Exhibition at the Open Storage.	Collections and Research Division
29	4/22	Activity/Event	Popular Science Guided Reading 2012: Stories Under our Feet	Collections and Research Division
30	4/27-5/6	Activity/Event	NSTM participated in the Nanotechnology Teacher Training and Creative Teaching Material Promotion Project of the Policy-Based Research Program under the Nanotechnology Education & Training Project of National Kaohsiung University of Applied Sciences. In this project, NSTM organized the Nanotechnology Carnival 2012: Exhibition of Education Achievements. The opening ceremony was held on April 27.	Technology Education Division
31	5/5-5/13	Exhibition	NSTM and the Kaohsiung City Government co-organized the 52nd Science Fair for Elementary and Secondary Schools in Kaohsiung 2012.	Exhibition Division
32	5/6	Activity/Event	NSTM organized the Happy Reunion for Amateur Collectors speeches.	Collections and Research Division
33	5/15	VIP	Director Yi Deng and guests from the Management Committee of Shanghai Museum visited NSTM.	Public Service Division
34	5/18	Activity/Event	NSTM organized the When Green Materials Meet Traditional Craft on the 518 International Museum Day.	Collections and Research Division
35	5/19	Activity/Event	NSTM finished the NSTM Happy Learning Project, which was a frinendly-neighbor activity, for the first half of the year.	Public Service Division
36	5/26	Activity/Event	NSTM organized the Popular Science Guided Reading 2012: Fun with Numbers.	Collections and Research Division
37	5/27	Activity/Event	NSTM organized the Mechanics Contest for Domestics Senior High School Students on commission of the Society of Theoretical and Applied Mechanics of the Republic of China.	Technology Education Division
38	5/27	Activity/Event	NSTM and Motech Cultural and Art Foundation co-organized the final of the 3rd Motech Cup Creative Competition Using Solar Cell. Motech Chairperson Yuan-Huai Simon Tsuo attended the award ceremony and presented prizes to winners.	Technology Education Division

No.	Date	Item	Event Summary	Proposing Unit
39	6/9-7/15	Activity/Event	NSTM organized the Liberty Lottery and Lottery Exhibition at the Open Storage to promote NSTM collections.	Collections and Research Division
40	6/20	Other	NSTM won the 4th Government Service Quality Award from the Executive Yuan and received the prize at the ceremony on June 20.	Secretariat
41	6/21-8/26	Exhibition	NSTM and C&S Creation co-organized Theo Jansen in Taiwan at the second and third special exhibition halls.	Exhibition Division
42	6/27	Exhibition	The opening ceremony of the Perpetual mission Relieve the Earth's Burden: CSC Group Zone in the Climate Change Exhibition Hall planned by NSTM and China Steel.	Exhibition Division Public Service Division
43	6/30	Activity/Event	NSTM organized the Popular Science Guided Reading 2012: Befriend with Geometry.	Collections and Research Division
44	7/1-9/30	Exhibition	NSTM and Motech Cultural and Art Foundation co-organized the final of the Creative Competition Using Solar Cell 2012. Fourteen award-winning works were displayed in the hallway on the 1st floor of NSTM.	Technology Education Division
45	7/2	Activity/Event	NSTM organized the Environmental Education and Morakot Post-Disaster Reconstruction Area Care activity.	Personnel Office
46	7/14-8/12	Activity/Event	NSTM organized the Summer Film Festival 2012 and broadcast seven 3D movies.	Exhibition Division
47	7/16-10/15	Activity/Event	With ITRI technical support, NSTM organized the LOHAS Energy Conservation House Promotion and Energy Conservation Volunteer Training at the LOHAS Energy Conservation House.	Technology Education Division
48	7/26	Other	NSTM volunteers opened the NSTM Volunteer Fund Account at the post office.	Public Service Division

No.	Date	Item	Event Summary	Proposing Unit
49	7/28-10/21	Exhibition	NSTM co-organized the Art of the Minutia with Taipei Story House and Miniature Museum of Taiwan on the 6th floor of the north complex. The opening ceremony was held on July 27.	Exhibition Division Public Service Division
50	7/31-8/10	Activity/Event	NSTM organized the Goodwill Angel Selection 2012.	Personnel Office
51	8/22-8/23	Exhibition	NSTM and the Chinese Society of Clothing co-organized the 25th International Clothing Exhibition at the Cosmos Star Plaza.	Exhibition Division
52	8/26	Activity/Event	NSTM organized the Child-Parent Day 2012 on the Grandparent's Day.	Personnel Office
53	8/27-8/28	Activity/Event	NSTM organized the 23rd MOE Agency Minister Conference on commission of the Ministry of Education.	Secretariat
54	9/6	Conference	NSTM and the Taiwan Charter of Museum Computer Network co-organized the Technology Application to Museum Collection Management Workshop.	Collections and Research Division
55	9/8-9/15	Exhibition	NSTM and National Kaohsiung University of Applied Sciences co-organized the Hydrogen Safety Education Exhibition at the Cosmos Star Plaza.	Exhibition Division
56	9/8-12/9	Activity/Event	NSTM organized the one model train test ride, one onsite training and education course, four education and promotion activities, and three fans experience activities at the Transportation and Civilization Exhibition Hall.	Exhibition Division
57	9/9	Exhibition	Grand opening of the Train Model Demonstration at the Transportation and Civilization Exhibition Hall.	Exhibition Division
58	9/10	Other	NSTM was recommended by the MOE to participate in the rating of the real property utilization vitalization category. NSTM was rated second in the fund utilization or business category of The Plans for Strengthening the Management and Utilization of National Property along with the National Taipei University of Science and Technology by the National Property Administration, Ministry of Finance.	Secretariat

No.	Date	Item	Event Summary	Proposing Unit
59	9/14-9/22	Exhibition	The Exhibition of the Love Your Family 515: The Word of Love Competition organized by the MOE and sponsored by NSTM was held in the lobby on the 1st floor.	Exhibition Division
60	9/17	Activity/Event	NSTM organized the Kending National Park Marine and Geological Environmental Education.	Personnel Office
61	9/22	VIP	Shanghai Science and Technology Museum curator Xiao-Ming Wang and four staffs visited NSTM.	Public Service Division
62	9/24	Other	The Collection Instruction Committee Meeting 2012 approved 113 ancient locks for the first permanent collection of NSTM.	Collections and Research Division
63	101/9/28-102/3/31	Exhibition	NSTM and Taiwan Tobacco & Liquor Corporation co-organized The Liquor with Rich Stories: The Feast by the Winding Stream at the special exhibition hall on the 4th floor of the south complex. The opening ceremony was held on September 28.	Exhibition Division Public Service Division
64	10/4-10/5	Conference	NSTM co-organized the International Conference on Museum Governance 2012 with the following six units: Tainan National University of the Arts (Graduate Institute of Conservation of Cultural Relics and Museology), NCKU Museum, National Sun Yat-Sen University (Department of Theater Arts), Chinese Association of Museums; and CAM Management Committee.	Collections and Research Division
65	10/6	Activity/Event	NSTM co-organized the TV Technology and Culture Forum: 50 Years of TV Development in Taiwan—Past and Future with Professor Qing-he Chen of Shih Hsin University and Professor Yen-long Chen of Chang Jung Christian University.	Collections and Research Division

No.	Date	Item	Event Summary	Proposing Unit
66	10/6-10/31	Exhibition	NSTM restored a TV station sub-control room with TV artifacts in our collection and displayed it during the Exhibition of the TV Technology and Culture Forum: 50 Years of TV Development in Taiwan—Past and Future at the Open Storage.	Collections and Research Division
67	10/6	Activity/ Event	NSTM and Kaohsiung City councilor Shu-Mei Huang and legislator Kun-Zhe Lee and Kaohsiung Philharmonic Cultural and Arts Foundation organized the Weekend Art Feast. Kaohsiung City Chinese Orchestra was performing an outdoor concert.	Public Service Division
68	10/12-10/21	Exhibition	NSTM co-organized the Navy Glory Arts Exhibition with the ROC Navy Fleet Command in the art zone on the 1st floor.	Exhibition Division
69	10/13-10/14	Activity/ Event	MOE subsidized NSTM to organize the Energy Science & Technology Creative Design Contest and Energy Science & Technology Teaching Activity Design Contest.	Technology Education Division
70	10/18-10/19	Activity/ Event	NSTM organized the 31st Science Fair for Elementary and Secondary Schools in Kaohsiung in collaboration with the Education Bureau of the Kaohsiung City Government. Education Director-General Xin-Hui Zheng and deputy NSTM director-general hosted the opening ceremony together.	Technology Education Division
71	10/25	Activity/ Event	NSTM and Chunghwa Telecom held the Love Endless-Free Learning Visits for Rural Children .	Public Service Division
72	11/7-11/22	Exhibition	NSTM and the Department of Civil Service Ethics, Ministry of Education, co-organized the tour exhibition of the award-winning works of the "Sunshine Taiwan—Combat Corruption Together" national calligraphy competition at the art zone on the 1st floor.	Personnel Office

No.	Date	Item	Event Summary	Proposing Unit
73	101/11/08-102/2/28	Exhibition	NSTM co-organized with Ancient Chinese Machinery Cultural Foundation the Under Keys and Locks at the special exhibition hall on the 2nd floor of the south complex. The opening ceremony was on November 8.	Exhibition Division Public Service Division
74	11/09	Other	NSTM won an Excellent Award from the National Environmental Education Awards. The award was presented at Ciaotou Art Village.	Technology Education Division
75	11/10	Other	Director-General Shun-hsang Chen and associate research fellows Mei-chen Chang, Shu-xin Lin, and Xiu-wan Mai received the Science Education Contribution Award from the Pingtung County Government.	Technology Education Division
76	11/10-11/25	Exhibition	MOE subsidized NSTM to organize the Exhibition of the MOE Energy Education Program. The opening ceremony and award ceremony were held in the triangular lobby of NSTM. Director Zhi-Wei Hu and Advisor Ping-Jun Huang of the Advisory Office of the Ministry of Education attended the event. Advisory Office Director Zhi-Wei Hu, NSTM director-general, Director Zhi-Chen Chen and Chief Su-San Xiao of the MOE Energy Education Program Office, Professor Yi-Fang Lee, and Vice President Xue-Xin Lu of National Kaohsiung Marine University together presided upon the opening ceremony.	Technology Education Division
77	11/11	Activity/ Event	The 15th anniversary of NSTM.	Public Service Division
78	11/11	Exhibition	The Time Traveling the NSTM permanent exhibition was held on the 1st floor of the south complex. The opening ceremony was on the same day.	Exhibition Division Public Service Division
79	11/11	Activity/ Event	The certificate of award and gift certificate for the "Bits and Pieces at NSTM" photograph recruitment were presented on the NSTM anniversary.	Personnel Office
80	11/12	Conference	Professor Yuan-chun Chen of Soochow University delivered the speech on "Science Spirit: Blending Science Spirit and Attitude with Museum Promotion.	Personnel Office

No.	Date	Item	Event Summary	Proposing Unit
81	11/14-12/30	Exhibition	NSTM and the Tree Valley Life Science Museum co-organized the Ancient Animal AR Exhibition in the hallway at the entrance of the Children's Science Center on B1.	Exhibition Division
82	101/11/17-102/4/7	Exhibition	NSTM and Artsource Corporation co-organized the Decoding the First Emperor's Mausoleum and Silent Worriers of Ancient China in the special exhibition hall on the 6th floor. The opening ceremony was on November 16.	Exhibition Division Public Service Division
83	11/17	VIP	CEO Xian-Ping Huang and other 24 members of Taiwan Children's Commodities R&D Center visited NSTM.	Public Service Division
84	11/20	Other	New Accounting office chife accounting officer Ya-Wen Tsai reported to NSTM at the handover ceremony.	Personnel Office
85	11/22	VIP	NSTM worked with the National Museum of Natural Science to hold the 2012 Cross-Strait Museum Practice and Operation Training Team. Jian-xin, Chang Deputy Director of the P.R.C State Administration of Cultural Heritage, took the delegation of 28 museum representative to participat in this event.	Public Service Division
86	11/30	Conference	NSTM co-organized the Interdepartmental Personnel Affairs Optimization Work Cycle in Kaohsiung Region and Personnel Affairs Benchmark Learning and Exchange of the Atomic Energy Council of the Executive Yuan with the following units: Atomic Energy Council, Institute of Nuclear Energy Research, Radiation Monitoring Center, National Tax Bureau of Kaohsiung, and Kaohsiung City Information Bureau.	Personnel Office
87	12/4	VIP	President of the Federation of Business & Professional Women, Taiwan, Hsiu-Lien Lu, took a grup of 24 guests, including President of the International Federation of Business & Professional Women, to visit NSTM.	Public Service Division

No.	Date	Item	Event Summary	Proposing Unit
88	12/9	Other	*Taiwanese Journal for Studies of Science, Technology and Medicine published* by NSTM was included in the TSSCI and THCI Core.	Collections and Research Division
89	12/12-12/23	Exhibition	The Tour Exhibition of the Award-Wining Works of the National Social Education Halls Cultural & Creative Product Design Contest was held in the hallway on the 4th floor.	Exhibition Division
90	101/12/13-102/4/7	Exhibition	The Stunning Pop-Up Book was co-organized by NSTM and United Daily News was held at the Cosmos Star Plaza. The opening ceremony was on December 12.	Exhibition Division Public Service Division
91	12/15-12/16	Activity/Event	NSTM organized the Hard-launched glider Competition.	Technology Education Division
92	12/17	Other	NSTM won the third prize of the Innovative Application Award in the Four Aspects of Reduction Project in Authorities and Schools from the Executive Yuan.	Secretariat
93	12/18	Other	NSTM Technologist Tai-Wei Chen won the Outstanding Water Saving Award 2012 for individual from the Water Resources Agency.	Secretariat
94	12/20	Other	NSTM won the second prize in the utilization revitalization category in the Plans for Strengthening the Management and Utilization of National Property.	Secretariat
95	101/12/22-102/4/14	Exhibition	NSTM and Choice Publishing co-organized the Cake Town at the second and third special exhibition halls. The opening ceremony was on December 21.	Exhibition Division Public Service Division

No.	Date	Item	Event Summary	Proposing Unit
96	12/24	Conference	Executive Yuan Minister without Portfolio Kuang-Nan Huang delivered the speech "Cultural & Creative Industry and Museum Development."	Personnel Office
97	12/28	Activity/ Event	NSTM organized the presentation for the following publications: *Preserving Memory: Conservation Practice of Technology-Related Cultural Objects* (physical) and *Those Days of Ammonia: NSTM Collection of Pictures on Kaohsiung Ammomium Sulfate Co., Ltd. and NSTM Collection of Artifacts of the Letterpress Printing Industry in Taiwan* (two e-books).	Collections and Research Division
98	12/28	Activity/ Event	NSTM Green Shop was opened in the lobby.	Public Service Division

科工館
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CHEN, I-WEN
LAI, JUO-NAN
CHEN, CHI-HSIA
CHANG CHIEN, CHIH-TING
HONG, SHUN-CHENG
CHOU, WAN-RONG
WANG, CHU-LIN
YANG, LI-WEI
WU, CHENG-JIA
YEH, CHIA-HSING
WU, CHING-YUN
WU, CHIA-YUAN
CHEN, TAI-WEI
CHEN, LIN-YUAN
CHANG,CHUN-CHING
HORNG, JING-YI
ZOU, JIA-PING
GER, TZU-HSIANG
HO, JUNG-FU
HONG, JHIH,MING
LEE, SHUN-HSIUNG
JU, YUAN-CHING
TSAI, CHENG-TE
KUO, CHUNG-HAO
SU, YU-JEN
LEE, HOUNG-JYH
WU, TING-FANG
YOU, SHUN-PING
SU, PEI-JHEN
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OU, HUI-LING
LIU, CHIN-HUNG
SUN, MING-SHENG
LI, CHANE-WEN
WANG, LIANG-CHUAN
LIAO, CHUN-HSIANG
YANG, MEI-HUI
TSAI,YA-WEN
HUANG, SHU JUNG
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LIU, SHU-YI
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CHEN, MAY-LIE
HSU, FENG-HSIANG
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HUANG, SHIH
CHOU, CHEN-MEI-WEN
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SHIH, PAO-HSIU
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LI, SING-HONG
HUANG, CHIU-HSUEA
KUO, WEN-CHEN
SHEN, FU-CHIEN
LIN, SHU-WAN
YU, CHEN PI-LIEN
HUANG, TSAI-FZNG
LIN, EN-HSIUNG
LIN, CHUEN-MEEI
HUANG, LIN-LIANG-HUI
CHEN, LI-HUA
LIU, HSUEH-CHIAO
LIN, WU-MEI-LAN
WU, JUI-PIN
TSAI, SHU-HSIEN
LEE, YA-LINE
CHEN, CHUNG-SHENG
SU, TENG-KUEI-YING
WU, HSIN-HUI
WU, TUAN-MEI
SU, CHIN-TSUNG
HO, YUAN-PIN
YANG, SHU-FEN
SHIEH, CHI-HUI
SHIU, LI-CHUAN
TSAI, CHIN-
CHEN, LI-CHU
CHANG, HSIU-CHIN
LIN, KUEI-CHEN
CHEN, MEI-HUEI
YANG, SHU-HUA
WANG, JEN-HSIU
CHUANG, CHIA-NU
LEE, LING-FENG
TSAI, TENG-YEH
CHEN, MEI-CHU
OU, CHIN-YUAN
LIN, HUI-YANG
LEE, SHU-CHEN
WANG, YO-LI
WANG, JUI-HAN
KAO, FEN
CHANG, SU-YING
CHO, HSLI-TZU
SHIH, LI-HUA
WU, PEI-HSUAN
CHUANG, PI-YUN
HSU, WANG-LI-YU
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LIN, SU-LING
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LIN, KUEI-MEI
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CHEN, YANG-SHOW-CHING
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CHENG, CHUN-HUA
SU, HUI-MIN
YU, JUNG-SHIN
LIOU, SHOU-YING
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CHUANG, CHUN-HUA
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WU, CHIN-TUAN
WU, CHIN-JUI
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LIEN, CHING-YUN
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WEN, YI-MING
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KUO, CHAO-HSU
WANG, LI-YULI
LEE, TING-LAN
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LI, LI-FENG
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LIN, SHU-CHUAN
YIN, WEI-HUNG
TSAI, LI-HSIANG
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CHANG, FENG-YING
DAI, KO-LI
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HUANG, TSAI-YUN
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SU, CHENG-CHIAO
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HORNG, MING-GU
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CHEN, TAI-RONG
SHIH, WAN-YI
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YANG, MAY-JU
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HUANG, WEN-HSIUNG
TUNG, WAN
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HUNG, YI-WEN
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LIU, CHUN-YUEH
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CHEN , TENG-CHAO
CHAO, CHENG-CHIEH
MA, SAI-FEN
TANG, CHIU
TSO, MING-HO
HIS, CHING-PING
WANG, HSIU-CHU
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CHUNG, YAN-SUH-JAU
WANG, CHIU-HSIANG
CHEN, NAN-SHENG
CHENG, SAN-CHANG
CHANG, MING-JUI
SU, YU-TING
YANG, HSUEH-FEN
WENG, TZN-SHUAN
LIN, JIA-HONG
LIN, MEI-LING
YAO, CHU-LI-HUA
HON, MI-SHOW
CHEN, SIANG-SYUE
HSU, SHIH-CHENG
HSIAO, LI-CHING
YU, CHIEH
TSAI, CHIA-YI
CHEN, SHU-FEN
CHANG, SHENG-CHI
HSU, CHIA-CHUAN
CHEN, HSIAO-HUAN
CHOU, HUI-LING
TESNG, YUEH-HSING
CHENG, LI-HUA
CHAO, HIS-CHING
YIN, JIAN-CHUNG
CHIANG, YU-YUN
CHEN, YU-CHIN
LIANG, CHANG-XING
LI, YUN-YIN
CHANG, CHIEN-CHUN
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CHOU, LING-CHUAN
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LIU, LEE-CHEN
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HSU, HSIEN-TANG
LIN, CHUN-SHIA
CHEN, HONG-SHING
CHANG, HSIU-LAN
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CHEN, LEE-HUA
SUN, KUO-MEI
PAN, FU-TSUN
CHANG, CHIEH-YUN
LEE, SHU-FEN
TUNG, CHENG-LIANG
LEE, YI-HOUN
CHANG, TIAN-JU
HUANG, KUN-TSE
CHEN, HSIU-HUA
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KUO, CHING-MEI

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CHU, YU-FANG
CHEN, SU-CHEN
CHEN , CHENG-HSIUNG
KUO, HUNG-CHUN
CHANG, MING-SUNG
HSU, CHIH-MING
CHANG LI, CHIEH-YIN
CHEN, YUNG-CHIANG
CHOU, YEONG-CHI
CHEN, SHUI-WANG
LIU, JIA-WEN
CHEN, YI-CHUN
CHEN, WAN-FU
CHENG, RUEY-SHAN
TU, HSIN-WEN
LEE, YURN-CHONG
LIN, SHOU-SHAN
LIU, CHIN-CHIH
HUANG, CHIN-HUEI
CHEN, JIUNN-NAN
LIN, HUI-LI
LIU, YEN-CHUN
HUANG, JEN-TSUNG
YAN, SHU-ER
TSAI, HSUEH-HSIANG
HSU, KUEI-JEN
LO, YU-HUG
HSIAO, CHIN-CHAO
HSIAO, SHU-HUA
YEH, PAI-MEI
HSU, SHU-CHUN
CHENG, CHEN-SU-LUAN
CHENG, CHI-MING
TSIENG, YEH-HUANG
WEI, CHIN-SHUN
CHEN, SU-ING
KUO, YU-CHING
WANG, LUNG-YUAN
YUAN, YA-CHIN
JUAN, YUEH-YUN
HUANG, SU-HUA
CHEN, PI-ER
TSAI, CHEN-YUAN
HUANG, YI-CHING
CHANG, FU-SHAN
HUANG, HUI-HIS
WU, TSUN-NENG
HUANG, YI-CHENG
CHU, MAN-CHEN
HSIEH, HO-MING
FANG, SU-LING
TSEN, HUI-CHAO
CHIU, CHIN-HUI
TSAO, EN-TE
WU, CHIU-HUAN
HSU, MING-FU
LIN, RONG-BIN
FENG, YU-KUEI
LIN, SHIU-SHIA
WU, SHIU-CHU
CHEN, MAI-YEN
CHAN, CHIN-YUEH
TAI, SHU-HUI
LIU, CHIN-HSIU
LIU, MEI-HSUEH
CHEN, YUAW-MING
CHUNG, LO-CHUN-YING
HU, CHIA-LIN
KUO, HSIANG-JUI
TSAI, HSIU-CHIN
CHANG, MAY-CHING
CHIU, HSUEH-LING
WEN, HUI-YEN
YEN , CHING-KAO
YU, MING-HO
CHUANG, SHUN-RONG
LEE, TI-PEI
HUANG, PO-HSIANG
DAN, CHIEN-MEN
KUO, KUEI-HSIA
HUANG, MEI-CHI
CHEN, CHUN-KUANG
YANG, WEN-CHUAN
LIAO, CHIN-SHIA
LO, CHIEH-TSUN
CHENG, YING-YI
KUNG, LEE-SU-FEN
KUNG , TING-HUI
YU, CHIH-HUA
HUANG, YANG-CHIH-HUI
YANG, HSIU-CHAO
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CHENG, LI-CHING
LEE, MU-FUNG
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