

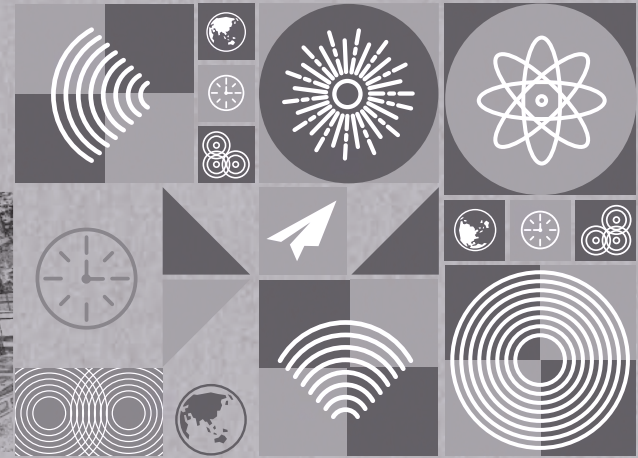
2018

NATIONAL SCIENCE AND
TECHNOLOGY MUSEUM

Annual Report



NATIONAL SCIENCE AND
TECHNOLOGY MUSEUM
Annual Report



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Letter from the Director-General



National Science and Technology Museum (NSTM) is the first national applied science museum in Taiwan, with the goal of integrating science into daily lives, and integrating daily lives with science, as well as Science Experience and Experience Science; in 2018 NSTM organized an entertaining and educational IoT and Smart Manufacturing exhibition in response to the emerging technology trend of Industry 4.0, which embodies the concept of "Everything that can be connected will be connected over IoT", allowing the public to understand the changes in life that they will experience with the advent of IoT technology. Furthermore, the Online to Onsite Visitor Behavior System is implemented to transform NSTM into a smart museum via informatization, consistent with the global museum development trend.

In addition, with the mission of training science enthusiasts, NSTM has upheld the spirit of Friendliness, Professionalism, and Innovation to organize science camps, technology competitions, workshops, on-site activities, science demonstrations, and lectures for visitors of different ages. The green living concepts of energy conservation, carbon reduction, and environmental

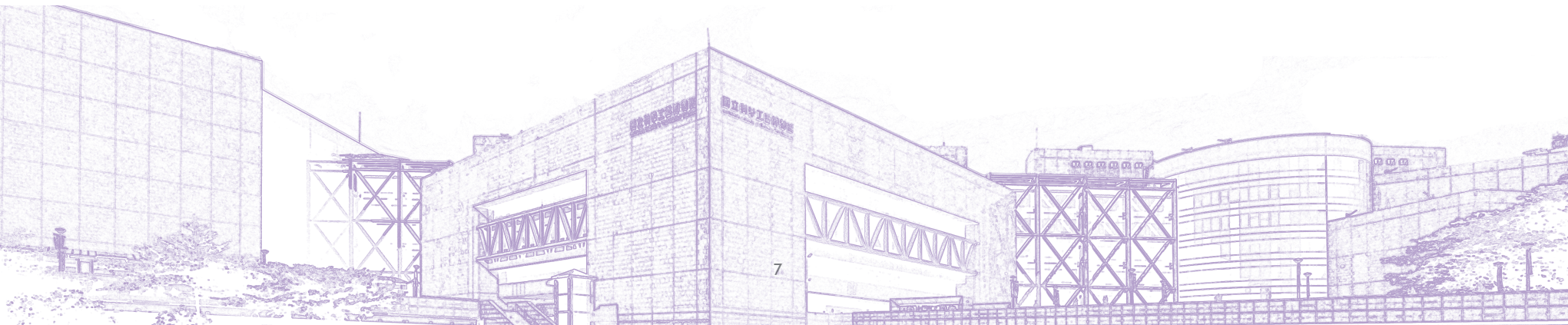
protection were promoted to the public to provide them with diverse options. The aim is to let them enjoy an educational, entertaining and recreational museum experience by creating a lifelong learning venue shared by everyone, thereby fulfilling our duties of social education as a museum.

At the same time, in order to bridge the urban-rural gap and offer economic disadvantaged school children the opportunity to take part in more scientific experiences and learning, NSTM has strived to obtain and consolidate external resources, build a charity platform for philanthropists, as well as continue to hold NSTM Lanterns of Love Program. The aim is to foster cross-field collaborations and reduce the urban-rural gap in terms of museum services.

Besides services within the museum, over the years NSTM has also constantly expanded our scope of service and partnerships. In 2018, NSTM's touring exhibitions were held in 8 cities, including Kinmen, Taipei, Taichung, Tainan, Pingtung, Yilan, Hualien, and Taitung,

setting foot in almost every corner of Taiwan. For NSTM's overseas endeavors, our footprints have reached Washington, USA; Penang, Malaysia; Bangkok, Thailand; Chongqing and Anyang, China. NSTM's Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad received the 2018 ASPAC Creative Science Communication Award, demonstrating the museum's soft power in education innovation and in expanding bilateral exchanges. Moreover, NSTM signed a cooperative agreement with Tech Dome Penang and National Science Museum Thailand to promote the mobile learning kit to Malaysia and Thailand to jointly promote Dengue fever prevention education.

Providing high-quality service to the public is the key focus of NSTM's operations, therefore we have continued to refine the quality of our services at the museum and on the Internet. In 2018, NSTM continued to utilize Qualicert accreditation and a professional management consulting firm to conduct mystery shopping and telephone service etiquette tests, thereby cultivating the service

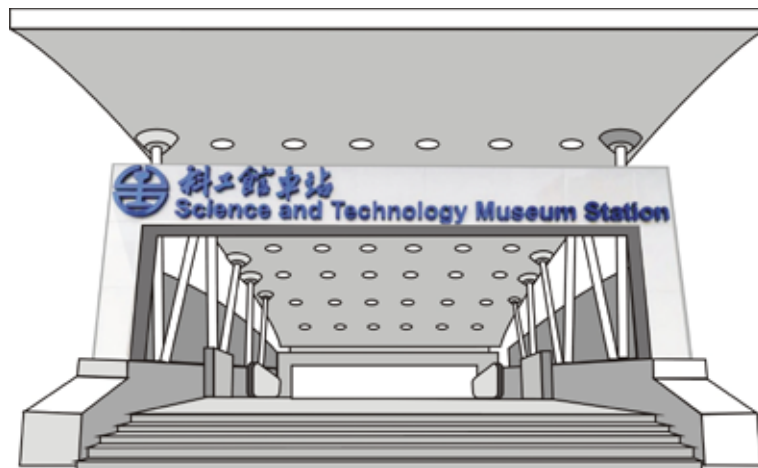


culture and capability of our colleagues, as well as optimizing NSTM's service quality to meet international standards. At the same time, NSTM's quality management system was upgraded to ISO 9001:2015 and received the ISO 9001 Plus Award for QMS Transformation and Innovation Management Benchmark, making NSTM the only museum in Taiwan to do so.

With the opening of Kaohsiung underground railway system and NSTM Station on October 14, 2018, providing visitors to NSTM with more convenient transport service alternatives, in the future we will also coordinate with the Taiwan Railways Administration to launch concession train tickets for schools. Inspired by the theme of Energy Conservation and Carbon Reduction, the eco-friendly One Day Tour

to NSTM tour will be unveiled to promote and materialize carbon reduction education and conducts, thereby creating a three-way win situation for NSTM, Taiwan Railways Administration and schools through cooperation.

We hope to create a museum featuring technological, leisure, and educational elements, where fun and interesting approaches are applied to provide people with scientific, creative, artistic and cultural living experiences. Furthermore, the aim is to elevate people's technology-related knowledge to the same level as the rest of the world. NSTM aspires to realize the vision of "Everyone is Welcome - A Museum You Will Want to Re-visit All the Time".

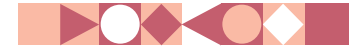


Director-General

Shiunn-Shyang Chen

Annual Performance and Accolades





Annual Achievements

Exert the function of life learning and social education in conjunction with the national education policy

► Seek resources to organize diverse science education activities

In order to achieve the goal of Science Experience and Experience Science, NSTM has organized myriads of science education activities, where the experiential learning approach is adopted to let the public enjoy the hands-on experience and establish the concept of incorporating science into everyday life. The aim is to materialize the philosophy of integrating science into daily lives, and integrating daily lives with science.

Various science education activities were held inside and outside NSTM in 2018

activities

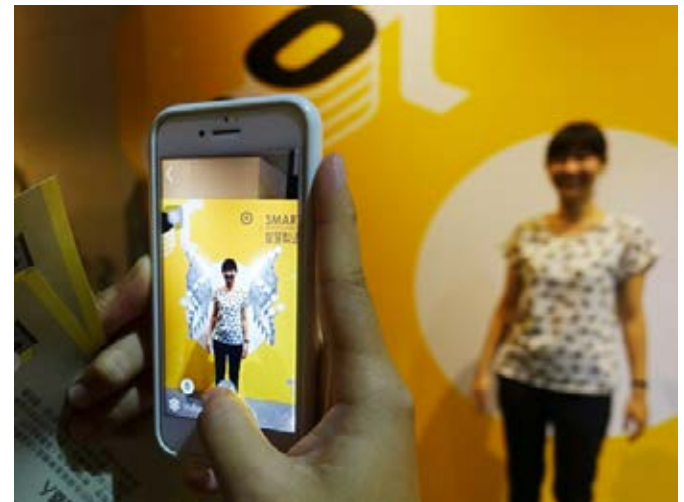
1,538

people served

291,203

► Building a smart technology exhibition and educational platform to enhance people's scientific knowledge

NSTM has forged museum-industry collaborations by working with the domestic smart vehicle, industrial robot and related component manufacturers to create the Smart Manufacturing – Smart Car and Industrial Robot exhibition areas. Exhibits collected include robotic arms, heavy motorcycles, EVs, and RV gear reducers etc. Visitors are able to engage in the diverse visiting experience via dynamic/stationary exhibits with corresponding app as digital media.



Visitors using digital media to activate the interactive experience installation and record the visiting process



▶ Developing innovative technology education activities and building a smart manufacturing education platform

The Robot Classroom and Programming Classroom were created, while robotic interactive learning and teaching aids, as well as innovative experiential course materials, were developed. In addition, Smart Technology Exploration and Smart Robot Promotion and Educational Courses were held in conjunction with the Creative Robot Competition in an effort to elevate the technology-related knowledge of the public and students in south Taiwan.



Facilitate international exchanges in popular science education in support of the New Southbound Policy

▶ Promote people-oriented, bilateral, and resource-sharing New Southbound Policy

In supporting the government's New Southbound Policy, NSTM relocated the Invention Exhibition to the Tech Dome Penang in Malaysia in 2017, making it the first collaboration between NSTM and New Southbound Policy countries. Lively, creative approaches were applied to attract visitors, in turn inspiring creativity and enabling them to appreciate inventions in Taiwan. The exhibition was subsequently relocated to the National Science Museum Thailand in Bangkok and received wide acclaim from the local public.



Scene from the Invention Exhibition In Tech Dome Penang, Malaysia



► Signing a cooperation agreement to promote Dengue fever prevention education

Using exhibits from the Dengue Fever Area of NSTM's permanent exhibition hall Diseases Prevention Combat Camp in conjunction with mobile learning kits, the exhibition was relocated to the Tech Dome Penang in Malaysia. Moreover, popular science and environmental health education-related experiences were exchanged with local schools. NSTM signed a cooperation agreement with Tech Dome Penang and the National Science Museum Thailand to promote Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad to Thailand and Malaysia. The purpose is to jointly promote Dengue fever prevention education.



Signed Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad learning kit promotion cooperation agreement with the National Science Museum Thailand

► ASPAC members join forces to organize the exhibition

NSTM, National Science Museum Thailand and Singapore Science Centre are all members of the Asia Pacific Networks of Science Centres (ASPAC). In 2018, we co-organized the Rice is Life Exhibition, where diversified and exhibition techniques were applied, drawing inspiration from daily life to showcase cultural diversity and industry achievements in the Asia Pacific region, so that the visitors will be able to experience and appreciate the diverse appearances of rice in the region. This is the first joint exhibition by ASPAC members, and the first stop was held at NSTM on November 29, 2018. The exhibition will be relocated to the National Science Museum Thailand on March 3, 2019.





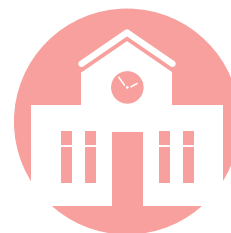
Expand the budget scale to generate more services and value

- ▶ NSTM Lanterns of Love Program's promotion and science education for economic disadvantaged school children



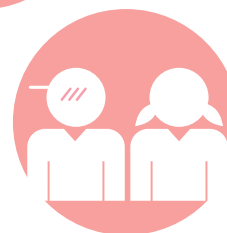
The NSTM Lanterns of Love Program was launched in 2013 and entered its 6th successive year in 2018. This year (2018), the program received a subsidy of NT\$3,091,440 (including NT\$300,000 subsidy from MOE) to provide economic disadvantaged school children from Taiwan and offshore islands to receive support and visit NSTM for free.

2018 NSTM Lanterns of Love Program served



schools

222



teachers and students

5,530

- ▶ Proactive measures to raise revenue and cut expenditure

In 2018, NSTM raised revenue by NT\$206,306,631 and cut expenditures by NT\$52,717,054, totaling NT\$259,023,685.

Total amount

259,023,685





► Pool social resources to improve exhibition service performance

In 2018, 71 joint exhibitions were held by pooling the resources of at least 84 social enterprises, an increase of 1.4% compared to 2017.

Total value of social resources raised

91,066,707



Robotic arm demonstration and technical support sponsored by HIWIN

► Development of theme merchandise based on NSTM's collections to increase revenue

Cultural & creative products were developed based on NSTM's collections to highlight their features and significance, as well as increase the revenue of the museum.



Broad Lock cultural and creative product

Cultural & creative products total revenue generated

2,607,177





Utilize social manpower resources to improve overall performance

In order to offer visitors more comprehensive services, NSTM strives to manage and utilize volunteers, student volunteers, and interns more effectively in facilitating the day to day operation of the museum. In 2018, a total of 1,159 volunteers were on duty for 199,863 man hours; 900 student volunteers accumulated 4,434 man hours of service; 77 interns accumulated a total of 21,623 man hours. The combined service time rendered by social human resources was 225,920 man hours, equivalent to that of 113 full-time staff at NSTM.

Social human resources obtained were equivalent to

113

full-time staff



In Pursuit of perfection to serve more people and raise more annual revenue

By improving NSTM's overall environment, service process designs and service quality, combined with diverse exhibits, films, and popular science education activities, we have won the public's hearts and totally served 3,061,142 people in 2018.

The total number of visitors in 2018 was

3,061,142



In 2018, NSTM's business management strategies, coupled with increased revenue and reduced expenditures, raised income from venue rent and creative products development, we made additional revenue for NSTM funds. Self-raised income was NT\$192,571,155.

In 2018, NSTM's self-raised funds were

192,571,155

The self-raised ratio was

49.02%



Honors and Awards

- ▶ NSTM is the only museum in Taiwan to receive the ISO 9001 Plus Award for QMS Transformation and Innovation Management Benchmark
- ▶ Received Outstanding Award from MOEA Water Resources Agency for water conservation
- ▶ Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad received 2018 Asia Pacific Network of Science and Technology Centres (ASPAC) Award for Creative Science Communication.
- ▶ NSTM's volunteer team received the Outstanding National Senior Citizen Volunteer Team Award at the 10th Elite Senior Citizen Award, which was organized by the Old Five Old Foundation.



NSTM received ISO 9001 Plus Award (QMS Transformation and Innovation Management Benchmark) from SGS



Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad received 2018 Asia Pacific Network of Science and Technology Centres Award for Creative Science Communication



NSTM's volunteer team received the Outstanding National Senior Citizen Volunteer Team Award at the 10th Elite Senior Citizen Award



- ▶ Completed ISO 50001:2011 energy management system international accreditation. NSTM was also registered with the Taiwan Accreditation Foundation (TAF) and received a certificate.
- ▶ Updated PIMS and obtained the BS 10012:2017 International Personal Information Management Certificate.
- ▶ Received Environmental Protection Administration, Executive Yuan's Outstanding Public Toilet Certification
- ▶ Won second place for 2017 Kaohsiung City Institution with Excellent Indoor Air Quality



Completed ISO 50001:2011 energy management system international accreditation



Received EPA, Executive Yuan's Outstanding Public Toilet Certification



Received an award for Kaohsiung City Institution with Excellent Indoor Air Quality

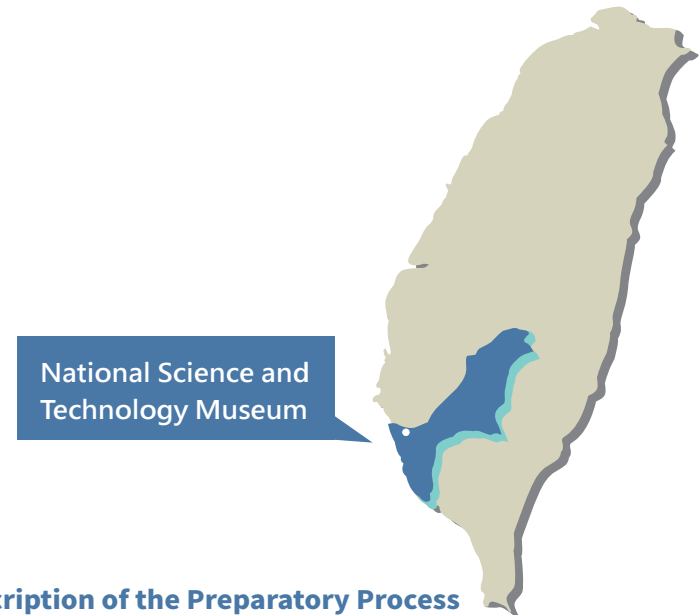
Historty





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 m² and the floor area is 113,557.69 m² (including North building: 97,734.93 m²; South complex: 15,258.88 m²; LOHAS Energy Conservation House: 563.88 m²) with 36.89 meters of structural height.



Brief Description of the Preparatory Process

- July 1986 — The Planning Council for NSTM was established.
- November 1988 — The Executive Yuan approved the construction plan.
- October 2, 1989 — Construction of the museum commenced.
- January 1, 1997 — The museum was officially established with the approval of the Executive Yuan and the Ministry of Education.
- July 26, 1997 — The south complex was opened.
- September 21, 1997 — The museum park was opened.
- November 9, 1997 — The museum was opened to the public.



North building

The building covers 15,007.55m². It contains the administration center, permanent exhibition galleries, special exhibition galleries, 3D Theater, Open Storage, Maker: the True Dreamland, NSTM Green Shop and Green Living Exploratorium.





South complex

The building covers 5,412.61m². It contains the Popular Science Library, Popular Science Café, auditorium, lecture rooms, meeting rooms and Collections Storage. The LOHAS Energy Conservation House was set up in 2009 and sits on an architectural dimension of 262.67 m².



Development Missions





1. Establish comprehensive collections policies in order to collect, purchase and maintain relics of technology.
2. Increase channels for utilizing museum collections and digitize relics of technology.
3. Implement exhibit update mechanism to phase out old exhibition themes and revitalize the museum exhibits.
4. Plan science education activities and teaching aids in conjunction with education policies and school resources.
5. Strengthen public service functions, capitalize on media and community resources to formulate diverse marketing strategies and increase NSTM's visitor numbers.
6. Improve NSTM's public safety by creating an outstanding environment and enhancing service quality.
7. Automate administrative tasks and promote an online lifelong learning channel.
8. Reinforce NSTM's digital services and elevate work efficiency.
9. Create a digital library and provide different information through the online database; establish themed libraries on the Museum's research topics.
10. Improve inter-museum exchanges and host academic seminars to improve the standard of research within the Museum.
11. Set up a Museum Mall that combines technology, recreation and education.
12. Boost museum attendance and build a world-class museum.

Organizational Structure





Post Allocation

Pursuant to the temporary regulations and staffing structure of National Science and Technology Museum as promulgated by the Ministry of Education with the Letter Year (1996)Tsan- Zi 85504426 on December 30, 1996, the National Science and Technology Museum has one director-general and one deputy director-general. Under them, the Museum operates through the Exhibition Division & Technology Education Division, Public Services Division, Secretariat, Personnel Office and Accounting & Statistics Office. Further in the light of the need for development of the Museum, the Information (MIS) Task Force was established on July 16, 1998 and Collection Research Task Force was established on February 1, 2001. Subsequently later on, pursuant to the amendment to the temporary regulations as promulgated by the Ministry of Education with the Letter TaiTsan- Zi - 0920113739A dated August 5, 2003, the Collections and Research Division was additionally established on September 1, 2003 and the establishment was approved by the Examination Yuan with the Letter Kao-Tai-Er-I-Zi 09200079281 dated September 22, 2003

Besides, the Organizational Act of the National Science and Technology Museum was duly enacted under Order of the President of the Republic of China, i.e., Hua Tsung-I+ Zi 10100022841 dated February

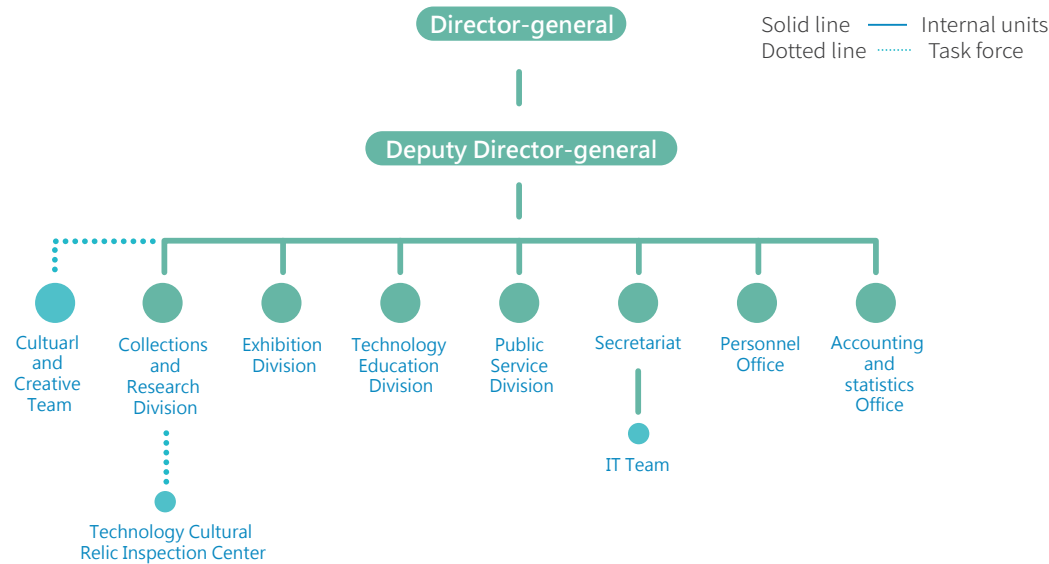
3, 2012 and was put into enforcement starting from January 1, 2013 under Order YuanShou- Yen-Tsung-Zi 1012260345 of the Executive Yuan (the Cabinet) dated March 8, 2012. Pursuant to the Organizational Act of the National Science and Technology Museum, the Accounting Office was reorganized into the Accounting and Statistics office

In light of NSTM's development needs, task forces have been formed to promote certain services:

1. The Maintenance Team was established on January 1, 2013. In December 2015, the performance of NSTM's "Maintenance Team" was reviewed; furthermore, in conjunction with the personnel number evaluation, the Maintenance Team was dissolved on January 1, 2016, in order to restore the normal manpower of various departments.
2. A Cross-departmental Cultural and Creative Team was formed on March 26, 2014 (abbreviated as CCT) in response to the cultural and creative development needs of NSTM, in turn opening a new chapter in NSTM's cultural and creative development and marketing.
3. In 2015, in response to NSTM's long-term needs in cultural relic restoration and inspection, and to collect technological



cultural relics in a more systematic manner, science analysis and restoration technical equipment was purchased, and the Technology Cultural Relic Inspection Center was formed under the Collections and Research Division on April 7. NSTM's organizational structure was shown as Figure 1.



FigIII 1 Organizational Structure



Posts

Budget headcount

A total of 84 posts were opened as defined by relevant law and regulations. After the assessment of Ministry of Education in 2018, our budget post openings were as follows: 28 Researchers, 47 Civil Servants, 26 Senior Contract Employees, 20 Junior Contract Employees, 8 Technical Workers, 7 Maintenance Workers, with a total of 136 posts budgeted. The budget headcount analysis is as Figure 2.

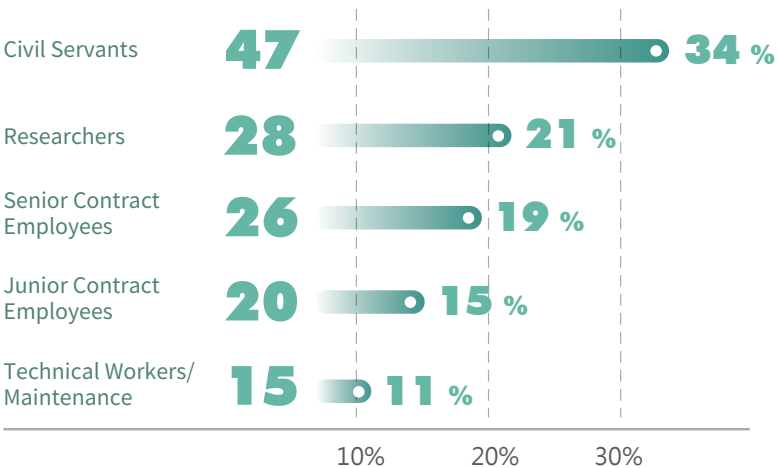


Figure 2 Budget Headcount

Existing headcount

Our existing headcount (excluding volunteers and commissioned service companies) has a total of 133 people. (61 Males, 72 Females). The female ratio is 54%, while the male ratio is 46%. There were 9 managers (including director-general and deputy director-general: 5 males, 4 females). The ratio of female managers is 44%, while the male ratio is 55%. There were 124 non-managers (56 males, 68 females). The ratio of female non-managers is 55%, while the male ratio is 45%. The managers and non-managers gender analysis is as Table 1.

Table 1 NSTM Managers and Non-Managers Gender Analysis

	Existing Number	Males	Male Ratio	Females	Female Ratio
Managers	9	5	56%	4	44%
Non-Managers	124	56	45%	68	55%
Total	133	61	46%	72	54%



Additionally, there were 28 Researchers (12 males, 16 females), 46 Civil Servants (26 males, 20 females), 44 Senior Contract Employees and Junior Contract Employees (14 males, 30 females), 15 Technical Workers and Maintenance Workers (9 males, 6 females). The personnel gender analysis is as Table 2.

Table 2 NSTM Personnel Gender Analysis

	Existing Number	Males	Male Ratio	Females	Female Ratio
Researchers	28	12	43%	16	57%
Civil Servants	46	26	57%	20	43%
Senior/Junior Contract employees	44	14	32%	30	69%
Technical/Maintenance Worker	15	9	60%	6	40%
Total	133	61	46%	72	54%

Educational Statistics

We currently have a total of 133 employees, out of which, there are 12 with PhDs, 64 with master's degrees, 51 college graduates, 6 high school graduates or below. Our personnel educational statistics analysis is as Figure 3.

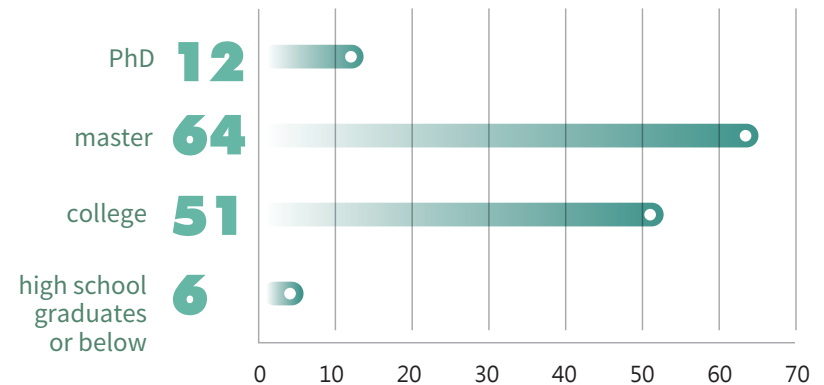


Figure 3 Personnel Educational Statistics



Researcher Backgrounds

Researchers educational statistics

We currently have 28 researchers, out of which, there are 10 with PhDs, and 18 with master's degrees. Our researchers' educational statistics analysis is as Figure 4.

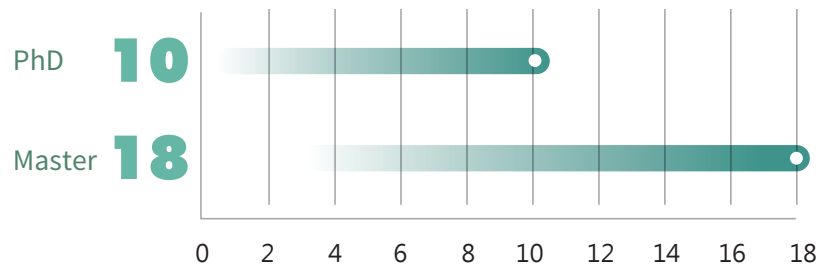


Figure 4 Researchers Educational Statistics

Researchers academic background statistics

We currently have 28 specialized personnel, out of which, 11 are affiliated with Science and Technology, 6 are affiliated with Education, 1 are affiliated with Design, 10 are affiliated with Humanities and Social Sciences. Our researchers' academic background statistics analysis is as Figure 5.

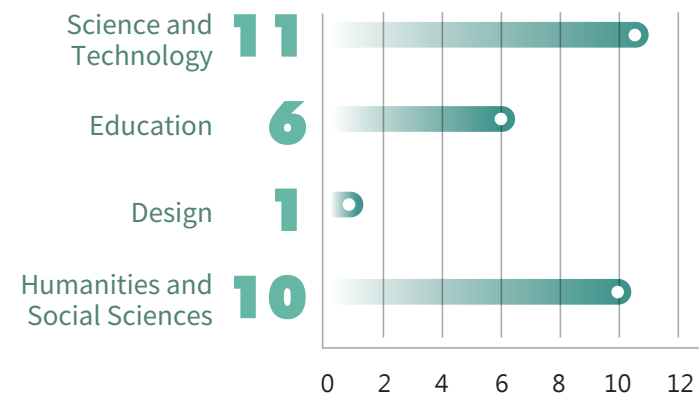
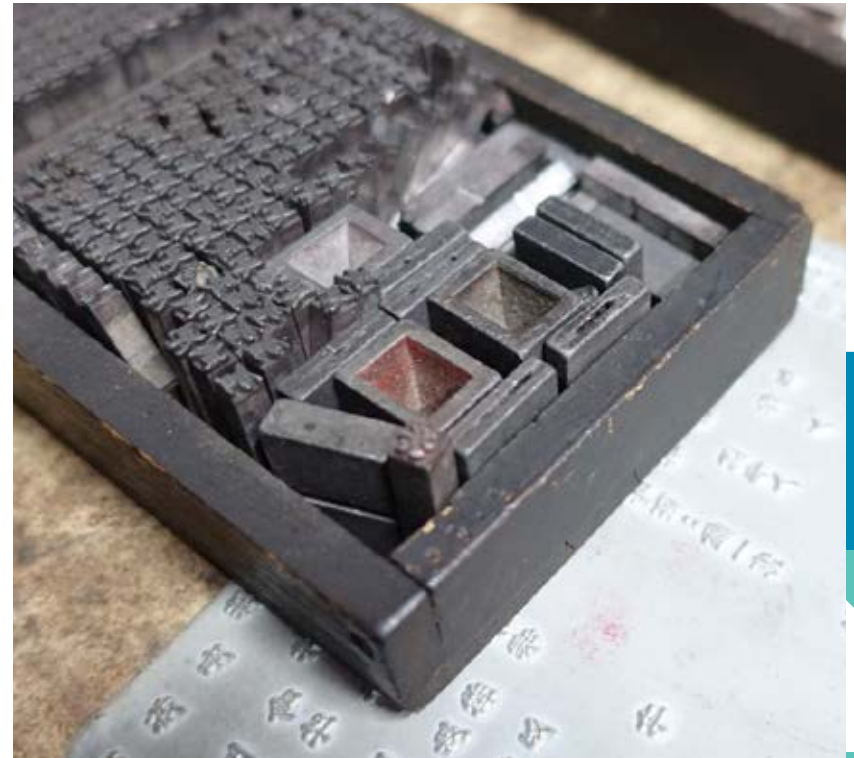


Figure 5 Researchers Academic Background Statistics

Collections and Research





Under the principle of sustainable development, the Collections and Research Division has brought together the concepts of "integrating science into daily lives and integrating daily lives with science" in promoting our key operations. Furthermore, we have applied the scientific spirit of "pragmatism", "rationalism" and "utilitarianism" to conduct the collection, research on important technological items, and the promotion of related activities. Our goal is to reinforce NSTM's professionalism and elevate operational performance.

The 2018 annual operations on object studies and promotion, collection management and applications, artifacts maintenance and inspections, Open Storage, academic exchanges, cultural and creative developments, research outcomes and publication statistics are as follows:

Object Studies and Promotion

In 2018, NSTM continued the interpretation, research and promotion of our collections and industry object, including the following themes and fields: measurement instruments, engraving printing, and typography, lock study, weaving industry, Taiwan sugar industry, communication and media technology industry, telecom collections, and disaster prevention-related artifacts. The findings of the study were used in academic papers and educational promotions.

In order to utilize NSTM's technological collections to develop "innovative values", we took advantage of new technology and multimedia technology to implement digitization and artifact research. Furthermore, related research was embodied in artifact exhibitions or digital website information based on the museum's collections, such as measurement instruments, printing antiques, and telecom collections, to elevate their accessibility and benefit.

In terms of metrology, we carried out 2 interviews with specialists from the metrological inspection field during the early years in Tainan, edited 6 interview videos, and took digital 3D photos of 25 artifacts; we also digitally scanned 1,025 pages of artifacts, produced metrology-related digital teaching material for From Past to Present

- Artifact and History of Metrology and Inspection, and hosted theme activities in conjunction with the World Metrology Day.



Video of interview with specialists from the metrological inspection field during the early years in Tainan entitled Origin and Transformation of the Development of Metrology and Inspection Industry in Tainan.



Digital teaching material: From Past to Present - Artifact and History of Metrology and Inspection



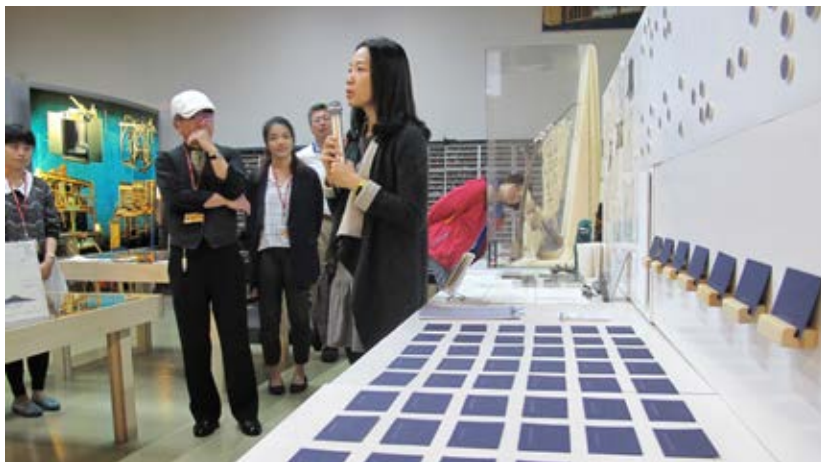
World Metrology Day metrology and inspection scientific knowledge promotional activity



As for printing antiques, NSTM boasts the premier collection of printing collections in Taiwan. In collaboration with the only remaining type foundry in Taiwan - Ri Xing Type Foundry, Tang Fu Printing and Creative Center - featuring the most comprehensive collection of movable types - and the Taiwan Typography Culture Preservation Association, together with NSTM's vast collection, research, exhibition, and educational experience, we hosted the Book of Time - Typography southern Taiwan travelling exhibition, as well as educational promotion and workshops in an effort to promote the letterpress cultural industry in Taiwan.



East Meets West - Movable Type lecture involved an in-depth dialogue between the creator of Gu Teng Meng Qi - Designer Chia-hsien Huang and owner of Ri Xing Type Foundry Chieh-kuan Chang.



The opening ceremony of Book of Time - Typography, with curator Su-hui Yu introducing the creative concept.



Practical Workshop - A Notebook for Me small book workshop



Besides, NSTM studied the historical development of world locks and lock antique repairmen, analyzed the designs, studied lock restoration, and innovatively designed modern locks. We also published one SCI academic paper, 2 EI papers, and one popular science article. Meanwhile, NSTM developed cultural and creative merchandise "Broad Lock" inspired by the research, which helped people understand more about classic antiques.

Along with the effective "2018 Telecom and Museum Cooperation Project", NSTM digitized 4,950 pages of the ancient references, finished photo shooting for the 130 objects exhibited in the Telecom Hall, added descriptions for 167 items, revised descriptions for 1,424 items, inspected and double checked 1,848 telecom artifact photos, revised 121 telecom artifact photos, and reviewed, expanded, and rectified the website of the Digital Telecom Museum. At the same time, 3 telecom cultural and creative products were developed, in turn achieving sustainable, comprehensive preservation and application of telecom artifacts through the digitized collection.



Broad Lock



Digital Telecom Museum website: <http://telecom.nstm.gov.tw/>



Collection Management and Applications

Since NSTM was opened 2 decades ago in 1997, we have adjusted various collection management systems over the years, resulting in the comprehensive system of today. In 2018, humidity and temperature-controlled storage in the North Complex was verified, cataloging of the Feng Xing matrices was renumbered, 187 items from 32 batches of artifacts were added to the collection, 7,388 printed artifacts were reclassified as a permanent collection by the 2018 Collection Advisory Committee, and 3,690 artifacts were classified as ordinary antiquities.

Since 2013, on average more than 200 items have been added to NSTM's collection annually. In 2014, the collection maintenance collaboration with the Bureau of Standards, Metrology and Inspection raised the figure to over 300 for the first time. In 2015, 341 items from the Morakot collection and computer themed collection were added. In 2016 and 2017, there were 919 and 405 artifacts added to the collections respectively.



Traditional Chinese Character matrices.



In 2018, NSTM continued to work with the Bureau of Standards, Metrology and Inspection and National Applied Research Laboratories. Using grants from the MOC, the replica of lead print Feng Xing matrices was cataloged; in total, 2,355 artifacts were cataloged and added to the collection, including 306 donated items, 3 collected items, 26 transferred items, and 2,020 purchased items. The stored items were given adequate storage conditions in accordance with their materials in order to provide them with a sustainable environment for preservation. Due to the implementation of the Group Object Renumbering and Re-cataloging Project in 2018, the annual accumulated collection has reached 52,550 items. Table 3 illustrates the collection statistics over the last 5 years.

Table 3 Collection statistics over the last 5 years

Item Year	Total	Collected	Purchased	Donated	Transferred	Other	Annual Accumulated Number	Temporary Custody
2014	9,551	25	1	302	0	9,623	40,133	0
2015	341	65	0	243	33	0	40,474	8
2016	919	1	0	326	76	516	41,393	0
2017	405	30	0	329	46	0	41,798	0
2018	2,337	3	2,002	306	26	8,415	52,550	0



Summary of artifacts collected in 2018

In order to increase the visibility and utilization rate of our collections in 2018, 520 exhibits and 558 telecom artifacts under NSTM's temporary custody were displayed in the permanent exhibition hall (including public space exhibitions), 231 collection items were displayed in NSTM's special exhibitions, 24 exhibits were loaned to other museums, and 331 exhibits were displayed in the Open Storage, and 402 exhibits were used in the Open Storage's monthly promotional activities. In 2018, NSTM achieved outstanding performance in utilizing the collections by implementing MOC's research program using Fengxing matrix No. 1 (4,631 items). Table

4: illustrates the utilization statistics of technology artifacts over the past 5 years.

Table 4 illustrates the utilization statistics of technology artifacts over the past 5 years

Item Year	Total	Research	Teaching	Exhibition*	Other**
2014	4,306	203	0	2,270	1,833
2015	3,893	250	0	2,201	1,442
2016	3,852	254	0	2,206	1,284
2017	4,101	2,020	0	1,747	340
2018	10,019	6,080	0	1,954	1,985

* Internal/external exhibitions, including Open Storage exhibits and telecom exhibits under NSTM's temporary custody.

**Including digitization, maintenance, inspection, picture loaning, cultural & creative application.



Artifacts Maintenance and Inspection

NSTM has been devoted to collection maintenance and inspection of cultural artifacts, systematic collection of technological antiques, provision of professional advice on the preservation of cultural relics, and training of preservation specialists. We have been playing an important role in South Taiwan's technological cultural asset maintenance.

Since 2015, NSTM has launched the Technology Artifact Health Supply Station service. In 2018, portable X-ray detectors, XRF handheld analyzers and non-destructive instruments were used to conduct 30 health inspections. In late 2018, NSTM purchased a dual wavelength UV analyzer; along with the training for preservation

volunteers and the assistance from external repairmen, NSTM aims to fully present our specialty in artifact preservation and maintenance.

Moreover, there are restoration

External inspection service
Assisted Tamsui Historical Museum in New Taipei City to conduct health inspection service for the Qing Dynasty iron cannon and offered our advice in terms of its conservation.



Assisted FCU to conduct XRF inspection service for the Mazu deity sculpture in the rear hall of Wanhua Longshan Temple in Taipei City - a national historic monument.



Conducted health inspection service for the plaque at Syongjhen North Gate, a municipal historic relic of Kaohsiung City.



demonstrations in our Open Storage from Tuesday to Friday, and we have a live show of the restoration process on the TV at the entrance to Open Storage so that visitors can see how our collections are maintained and repaired outside the Open Storage.

Besides 30 inspections, we conducted 12 charged inspection and maintenance services in 2018. It not only showed our specialty in the preservation of technological heritage but also brought in an additional revenue of NT\$1,555,604 for the museum and promoted the knowledge and technique on the preservation of historic works.



NSTM was commissioned by the Tainan Municipal Administration of Cultural Heritage to inspect and evaluate the cultural values of weaving artifacts in Wannian Temple in Wanli.



NSTM was commissioned by Hong Cheng Construction Co., Ltd. to repair the color painting of Gate Gods at Cihou Tianhou Temple, a municipal historic monument. The photo shows summer interns experiencing cleaning, maintenance, and drawing of artifacts.



In 2018, NSTM conducted 8 preservation workshops including 3 rounds of Book of Time - Typography, 4 Mobile Science Experiment Station for Scientific Learning in Schools in Remote Townships workshops, and one Hand Weaving workshop. Professional lecturers and restoration specialists demonstrated the process of artifact restoration in class, while the students took part in case studies and restoration projects, which helped them understand the importance of cultural asset preservation.

In addition, NSTM and National Palace Museum co-organized 2018 Museum Exhibit Preservation and Restoration Workshop on September 28, where the aim of the workshop offered case studies from delivered speakers by sharing their practical experience on museum conservation work. For publics, the acquired topics should be submitted and divided with several types of museum collections, such as drawings, books and archives, objects, paintings and textiles. The expected outcome was achieved to share case studies, thoughts and achievements in collection management, restoration, and scientific analysis, thereby facilitating exchanges in the field of professional museum artifacts and art restoration in Taiwan, and further promote related education. Furthermore, the meeting strengthened museum expertized profession resulted from 17 papers delivered by 120 participants.



Funding from the Chinese Association of Museums was used to host the 2018 Museum Exhibit Preservation and Restoration Workshop academic activity at the B₁ Multimedia Room of National Palace Museum.



Open Storage

Open Storage was completed in 2009 and incorporated into NSTM's experience facilities in July 2010 and officially opened to the public. Admission to Open Storage is NT\$30 per person (NT\$25 for groups of 20 persons or more). Visitors to NSTM Open Storage are led by tour guides. Unlike storage in conventional museums that are normally closed to the public, NSTM's Open Storage embodies artifact research in exhibitions and promotions. Besides revitalizing the museum's collection and familiarizing the public with the artifacts, a wide range of experiential activities were conducted to

enhance people's understanding of the scientific principles behind the artifacts and their applications.

Visitors to the Open Storage can view collected items closely and understand related tasks such as museum collection studies, collection management, and cultural artifacts maintenance, thereby conveying the importance of science, industry culture, preservation and maintenance. In 2018, NSTM held 12 Open Storage Collection Promotions, with a total of 10,886 visitors. Table 5 shows the statistics of Open Storage in the last 5 years.



Exhibition of Achievements in Metrology

Table 5 Service performance of Open Storage over the past 5 years

Year	Number of visitors	Income generated
2014	13,993	167,575
2015	16,755	187,655
2016	16,408	107,680
2017	14,786	122,930
2018	10,886	72,370



Measuring Instruments - Temperature/Humidity/Atmospheric Pressure Collection Exhibition and AR/VR Experience Activity was held at the Open Storage.



Foro Piano experience

The public can be familiarized with the internal structure of a piano via the modified, see-through piano, and they can also play the piano to understand how pressing the keys activates the hammers that in turn strike the string to produce sound.



Platen Press Printing Experience



Domestic and foreign experts and scholars in museum economics attending the keynote speech and dissertation presentation.

Academic Exchanges

Adequate themes were chosen from the field of museology, and both domestic and foreign scholars and experts were invited to participate in discussions. From October 4-5, 2018, NSTM and 5 organizations including the Graduate Institute of Conservation of Cultural Relics and Museology, Tainan National University of the Arts, NCKU Museum, the Department of Theater Arts, National Sun Yat-sen University, Office of Arts and Culture, Cheng Shiu University, and the Chinese Association of Museums jointly held the 2018 International Conference on Museum Economics.

5 foreign lecturers and 4 domestic experts/scholars were invited to attend the conference and engage in discussions on museum economics-related topics. The aim was to expand knowledge in the field of museum economics and facilitate practical application in domestic museums, thereby fostering the progress of the museum community. A total of 273 people took part in the conference.



Cultural and Creative Developments

We set up a cross-division team for cultural and creative product development in 2014, which focuses on designing cultural and creative products, cooperating with other organizations and developing new products, shipping and selling, expanding new markets, self-marketing and managing legal affairs. The creatively designed products not only highlight the characteristics and significance of NSTM's collections but also make our collections more visible to different groups.

In 2018, besides producing and selling NSTM's cultural and creative merchandises, we also strived to obtain the bid of Railway Reconstruction Bureau, MOTC project and the 2018 Telecom and Museum Cooperation Plan, resulting in the development of 7 bespoke cultural and creative products. In total 8 cultural and creative products were developed in 2018, including Broad Lock; Railway Reconstruction Bureau, MOTC's Rail USB Flash Drive; Railway Reconstruction Bureau, MOTC's Overhead Contact key ring, Railway Reconstruction Bureau, MOTC's Memorial cap of Railway Bureau, MOTC; Railway Reconstruction Bureau, MOTC's Multi-function mobile phone holder; Power Bank; Telephone-shaped Metallic Bookmark; and Colorful Dry Noodles etc. In the future, NSTM will continue to tap into our cultural and creative potential

and collaborate with suppliers to develop customized, novel and interesting cultural and creative products in response to the needs of the industry and the market.



Overhead Contact key ring cultural and creative product



Rail USB Flash Drive cultural and creative product



Multi-function mobile phone holder cultural and creative product



Rail USB Flash Drive cultural and creative product



Broad Lock cultural and creative product



So far, 58 cultural and creative products are available through the NSTM shop. In order to provide the public with more convenient, diversified shopping experiences, besides purchasing them at NSTM, the souvenirs are also available through NSTM's cultural and creative

merchandise webpage. In total, 4 major categories of souvenirs are available, namely Stationery, Puzzle, Fun Life, and Boutique. Table 6: Sales figure of cultural & creative products over the last 5 years.

Table6 Sales figure of cultural & creative products over the last 5 year

Year	Sales figure
2014(July to December)	201,993
2015	1,145,601
2016	1,567,907
2017	1,639,784
2018	2,607,177



Cultural and creative shop website: <https://shop.nstm.gov.tw/index.aspx>



Research Outcomes and Publication Statistics

For the research findings in 2018, a total of 36 journal papers, 42 conference papers, 1 book and 6 related publications were published. NSTM also participated in 35 research projects. The devotion and effort of the NSTM personnel proved to be beneficial to museology-related fields. Table 7 illustrates the research findings and publications over the past 5 years.



Table 7 Research findings and publications over the past 5 years.

Item Year	Journal Papers	Conference Papers	Research Projects		Invited to Academic Lectures	Publications					Sympo- siums	Lectures
			NSTM Personnel as Hosts	NSTM Personnel as Participant		Books	CDs	Text Messages	Folded Leaflets	Journals		
2014	25	50	10	6	17	3	0	1	9	2	2	18
2015	27	41	12	6	12	4	0	1	0	2	9	26
2016	26	35	18	17	23	3	2	7	1	2	2	22
2017	43	47	21	6	24	6	0	0	2	2	4	45
2018	36	42	30	5	5	1	0	0	4	2	11	6

Exhibition





NSTM introduced a total of 40 exhibitions, renovated and reopened one permanent exhibition hall, as well as updated partial exhibition units in 10 permanent exhibition halls and 26 self-curated and joint exhibitions. By constantly maintaining the exhibits and quantifying our services, we have achieved a normal exhibit functioning rate of over 97.32%. NSTM also developed the 3D Theater alternative content service project to improve the operational performance of the theater. Refer to Table 8 for the number of exhibitions organized and exhibit hall renovations over the past 5 years.

Table 8 Number of exhibitions organized and permanent exhibition hall renovations over the past 5 years

Item Year	No. of Exhibitions	Permanent exhibit hall renovation		Normal functioning rate of Exhibits
		Complete renovation	Partial renovation	
2014	29	3	8	91.85%
2015	33	2	5	92.50%
2016	39	2	6	94.32%
2017	34	1	8	96.69%
2018	40	1	10	97.32%





Permanent Exhibition Hall Renovation

1. Children Science Center : "Fun City" permanent exhibition hall

This is a miniature city co-constructed with the Road Traffic Safety Committee, Ministry of Transportation & Communications (MOTC). Divided into 2 major areas, namely the Shopping Area and Children's Transportation Park, they serve to imbue children with science, life and road traffic safety-related knowledge. The miniature city consists of roads, sidewalks, pedestrian crossings (zebra crossing), pedestrian traffic signs, and a variety of store buildings, etc. Each

visitor entering the exhibition hall must obey the traffic signs and regulations in order to convey the correct concept of road-crossing safety to children. Moreover, parents and their children can explore science in life and feel free to have fun and experience the facilities in the Shop Area. This area is suitable for children aged 3-8. It was officially opened to the public on September 28, 2018.



Shop Area



Children's Transportation Park



2. Partial updates made to the "Magic Land"

Magic Land permanent exhibition hall is suitable for children aged 7-12. Consisting of 3 areas, namely the Magic Forest, Illusion Village and Castle of Light, each area is protected by a guardian with a unique personality. With their help, the children can explore knowledge pertaining to sound, light, and images. In 2018, 10 interactive exhibits were updated: Discovering Fairies, Secret of the Sound Mixer, Changing Color Fireplace, Changing Color Castle, Persistence of Vision, Mystery of Light, Reflection of Light, Absorption of Light, Penetration of Light, Moving Gold Bullions, Introduction to the Spectrum of Light, RGB Color, Optical Illusion, and Motion Sensing. These scientific exhibits attract the children to re-explore the castle by employing novel approaches.



Secret of the Sound Mixer exhibit

3. The Story of Taiwan Agriculture: Select Products from Agricultural Villages

Select Products from Agricultural Villages in the Story of Taiwan Agriculture exhibition hall were updated in March, 2018 to exhibit the products from 9 units that won the Fine Agricultural Products Awards in 2018, such as Fourways Dairy Factory's Whey Sparkling Drink, Ming Chuan Ecological Leisure Farm's Pineapple Low Salt Black Bean Soy Sauce, and Uncle Sweet's Purple/Golden Sweet Potato and Five Grains Bar Gift Box, as well as other innovative agricultural products. The purpose of the exhibition is to promote the developmental accomplishment of the rural villages and liven up the exhibits.

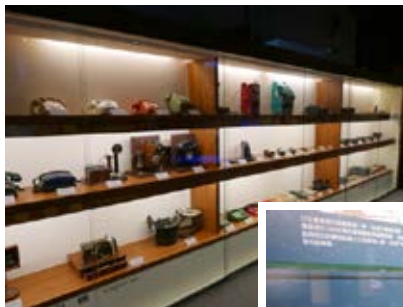


Photo of Select Products from Agricultural Villages



4. "Telecom@Taiwan" : Exhibits reconditioning operation

The exhibition hall houses 940 exhibits that have remained in the display cabinets for more than 7 years since it was completed in late 2010, thus many of them are covered in dust. In order to maintain the appearance and condition of these exhibits, as well as to make any necessary inspection and adjustment, the exhibits reconditioning operation was conducted in 2018. After over 2 months of work, the exhibits have been restored to their former glory. Oil leakages were discovered in 5 telephone exhibits, and appropriate steps have been taken to protect them.



Reconditioned glass display cabinet



Special plastic protective cover on the telephones

5. Partial exhibits made to the "Fantasy"

Constructed in 2006 in the basement, "Fantasy" is suitable for children aged 5-10, attracting countless school children below the level of junior high school since its opening. Since various facilities in the exhibition hall are outdated, they were updated to provide children with brand new science experience. Reopened on April 1, 2018, "Fantasy" takes the visitors to explore science in life with attractions such as Snowy Island, Oriental Island and Tropical Island. In Snowy Island, they can get to know living creatures in the snow, and compare the performance between ordinary car tires and snow tires in terms of traction; in the Dressing Mirror in Oriental Island, visitors get to try on traditional costumes of India, Vietnam, Myanmar, and Thailand without leaving the country and changing garments; in Tropical Island, visitors can learn special creatures of Madagascar through the specially designed landscape and interactive games. In addition, a wide selection of exciting exhibits is available for visitors to meet different interesting inventions!



The overwater bungalow landscape allows children to learn food preservation-related knowledge.



6. "Textiles and Clothing": Magic Dressing Room and MIT New Energy Window updated

Since STUST's Department of Multimedia and Entertainment Science developed the Magic Dressing Room 2.0 system last year, the software and hardware update operation has been completed this year after several rounds of discussions. At the same time, Everest Textile also helped to update the MIT New Energy Window using smart garments and other high-tech textiles.

- (1). Magic Dressing Room 2.0: Increased the options and practicality of garment experiences, while the experience is made more captivating and interesting. Visitors may send the photos to their own envelopes as memorabilia. The newly added 3D virtual garments, such as the space suit, armored warrior, adorable animal costume, traditional costume from various countries, and clothes from existing store brand collections are available for the visitors to mix and match in order to create their own design.
- (2). MIT New Energy Window: Smart garment, smart watch, conductive yarn and fabric form the main theme of this exhibit. Actual objects are combined with science elements to explain to the public textile's advancements over the years and its future outlook. This year, the Department of Fashion Styling

& Design Communication, Shih Chien University Kaohsiung Campus, cooperated with NSTM to jointly promote design, innovation, R&D, and application of fashion. The Sparkling New Stage was created in the Textiles and Clothing exhibition hall, presenting the clothing designed by the teachers and students. An exhibition lasts for roughly 1-2 months on average and the works are displayed in rotations. Visitors may take this opportunity to understand the achievements schools in Taiwan have made in the field of fashion design.



Sparkling New Stage



MIT New Energy Window



7. Partial exhibits update made to the "Open Sesame Science Exploration Center" hall

The interactive exhibition technique was employed, allowing the visitors to operate observe the anti-UV performance of uncoated quartz glass and TiO_2/ZnO /nanodiamond coated glass. UVI (ultraviolet index) is presented in the form of scrolling text, showing various coatings' anti-UV properties. Light boxes are used to introduce the significance of different indexes. An animation is utilized to explain the principle and application of anti-UV technology in a step by step manner. First, the sunlight spectrum and UV are explained, this is followed by the difference between UVA, UVB, and UVC, and their harmful effects on the human skin. Additionally, UVI is also introduced along with existing methods of combating UV and the ingredients of sunscreens. Lastly, the

principle and advantages of nanodiamond in defending against UV is explained.



UV protection technology exhibit

8. "Pavilion of Dream Transport": Motorcycle Trip to Fo Guang Shan exhibit updated

Since it was opened in 2015, Pavilion of Dream Transport has proven to be exceptionally popular among school children and youths. This year, NSTM collaborated with the Road Traffic Safety Committee, MOTC, to improve the hardware and software of the motorcycle ride exhibit named Motorcycle Trip to Fo Guang Shan. A commercially available electric motorcycle is modified to serve as the control installation, where real road footage is combined with 3D modeling technology to simulate realistic traffic conditions, so that the visitors can be immersed in the driving scenarios designed into the game. As they encounter different traffic conditions, the visitors will be reminded to pay attention to traffic rules such as signaling when turning, looking out for the larger turning radius of large vehicles, speed limits of different road sections, and yielding to emergency vehicles, etc. The exhibit incorporates virtual (3D modeling, VR helmet) elements with real (real motorcycle, familiar



road sections) to create a realistic interactive experience. Visitors can experience the authentic sensation of riding without being exposed to the dangers of traffic accidents.

Motorcycle trip To Fo Guang Shan



9. "Power and Machines": "Smart Car" and "Industrial Robot"

Under the framework of IoT exhibition education area in 2017, smart manufacturing application has been introduced to create Smart Manufacturing – Smart Car and Industrial Robot in the Power and Machines exhibition hall. The exhibit was opened to the public on November 9, 2018, in conjunction with NSTM's anniversary celebration. Smart Manufacturing scenarios were created using industrial robots, smart cars and motorcycles, while robotic interactive installations, AR and VR technology were applied to let the visitors gain deeper insight into robots as well as the structure, technological development and application of smart vehicles. Visitors can also download the exhibit area's app



to interact with the exhibits and accumulate points. The points can be used to redeem merchandise from the robots.

Smart vehicle VR experience



Various interactive robotic arms

10. Nobel Prize Area updated

Symbolizing the pinnacle of scientific and cultural achievement, the Nobel Prize is held in Stockholm and Oslo every year! Set up according to Mr. Alfred Nobel's will, the Nobel Prize is awarded for "The Greatest Benefit to Mankind". The Nobel Laureates are announced in October every year. The prizes are divided into 6 categories: Physics, Chemistry, Physiology or Medicine, Literature, Peace and Economic Sciences. NSTM provides an easy to understand introduction of various laureates and their accomplishments. The 2018 Nobel Prize in Physiology or Medicine was awarded jointly to 2 scientists for their discovery of cancer therapy by inhibition of negative immune regulation. The Nobel Prize in Physics 2018 was awarded to 3 scholars for their method of generating high-intensity and ultra-short optical pulses. The Nobel Prize in Literature 2018 is due to be announced in 2019.





Special Exhibitions Curated by NSTM

1. Smog Pollution : PM2.5 Personal Protection

In order to remind people of smog pollution's impact on the human body and to demonstrate the steps needed to protect us from the existing environment, NSTM launched the Smog Pollution: PM2.5 Personal Protection Special Exhibition. The exhibition's centerpiece is the Real-time Air Quality Monitoring Platform, which is an online system developed by NSTM, showing the outdoor air quality in the form of interesting, lively animations combined with NSTM's mascot.



Exhibits of Smog Pollution : PM2.5 Personal Protection Special Exhibition



Opening Ceremony of Smog Pollution : PM2.5 Personal Protection Special Exhibition

2. Wow! Somatosensory Adventure 2.0

NSTM unveiled the Wow! Somatosensory Adventure 2.0 Exhibition on December 13, 2016 in order to continue NSTM's goals in organizing fun, educational exhibitions, and to promote the philosophy of popular science education, so that the public can learn and experience the principles of science amid a joyous atmosphere in the museum. The most popular attraction is the 3rd tallest spiral slide in the world. Completed in 2016, the slide measures 63m long and 27m tall; consisting of 7 turns, the slide's top speed can reach a staggering 82km/h (not taking into account friction and air resistance). The sliding experience offered by the slide demonstrates scientific terms such as free fall, acceleration of gravity, centrifugal

force, action and reaction force, and weightlessness, etc., in an easy to understand scenario, so that the visitors can appreciate the meaning conveyed by science in person. Three additional exhibits in the exhibition including Laser Battlefield, Gunslinger Showdown, and GOGO Racer provide the entire family with diverse scientific experiences.



Laser Battlefield



Gunslinger Showdown



3. Art Exhibition Area

NSTM has set up special gallery areas at the west corridor on the first floor and in the Art Café on the second floor to utilize the space for the public and enrich their visiting experience. Besides using the venues for NSTM exhibitions, artists can also submit applications to host their exhibitions here. The artworks exhibited include traditional Chinese paintings, Chinese calligraphies, oil sculptures, seal carvings, artistic designs, crafts, pottery, and photo collections. Through these art exhibition activities, aesthetics is applied to education to inspire aesthetic experience through beauty and cultivate people's appreciation and taste toward aesthetics, as well as to enlighten creative thinking to achieve educational goals. In 2018, 8 joint art exhibitions were held including the Heart Meets Art :

Chaing-shan Tsai Photography Exhibition; Special Exhibition of Taiwanese Agricultural Products; and Coloring Taiwan : Dynamic Harbor City; as well as Dialogue between Art and Soul; Joint Exhibition by Prominent Calligraphers and Painters from Beijing and Taiwan; A Decade of Chinese Zodiacs : A Decade of Pottery; Seeing the Complete Picture from Small Details : Miniatures and Calligraphy Art Exhibition : Seeing Gender Diversity Photography Exhibition; Art in Jiangnan : Sheng-yang Cheng Art Creation Exhibition; and the World Children's Rights Month Painting Exhibition etc.



Seeing the Complete Picture from Small Details : Miniatures and Calligraphy Art Exhibition



Classic Beauty: Oil Painting Creative Exhibition

Art in Jiangnan : Sheng-yang Cheng Art Creation Exhibition

World Children's Rights Month Painting Exhibition



Intelligent Maintenance and Management : Creating Specialties of Exhibitions

1. Expanding and optimizing the intelligent inspection system

After 30 intelligent detection and reporting devices were installed in exhibits across 7 exhibition halls in 2017, NSTM continued to expand the automatic exhibit failure reporting system in 2018 by increasing 21 intelligent detectors featuring computer monitoring software and intelligent reporting buttons for the experiential facilities. As of 2018, 61 exhibits in 17 exhibition halls have been fitted with the intelligent inspection system. On the other hand, the Exhibit Malfunction Reporting function was incorporated into the multifunctional NSTM App, so that when visitors encounter malfunctioning or abnormal exhibits in the museum, they can notify the NSTM maintenance staff by entering the corresponding exhibit code on the App, thereby expediting the efficiency of exhibit repairs. The multichannel approach allows people to report malfunctioning exhibits to NSTM via the app immediately so that they can be repaired in time. The automatic recovery of the computer program in the event of installation exception helps to improve the efficacy of the intelligent maintenance and exhibition normal rate. With professional and accelerated maintenance efficiency, NSTM can provide visitors with a better experience and service

quality. In addition, with a comprehensive exhibit database, NSTM's maintenance staff will be able to enter the problems discovered during inspection into the maintenance database via their cell phones, so that analyses for exhibits with frequent malfunctions or abnormalities can be conducted to formulate improvement measures. In doing so, updates performed on exhibits can be applied to new exhibit designs, thereby improving the normal functioning of exhibits.



Intelligent reporting button for experiential facilities



Computer monitoring software



Systematic detection and reporting



2. Achievements in improving NSTM employees' professional knowledge: In-house produced exhibits

In 2018, NSTM Exhibition Division's maintenance and design colleagues collaborated to develop 3 interactive exhibits, including Water Droplet (Cam Mechanism Application), Angel of Transmission (Mechanical Transmission Principle), and Maglev Vehicle (Magnetism). These exhibits serve to demonstrate scientific principles. The maintenance crew capitalized on their expertise to produce in-house exhibits through the process of trial and error, in turn enhancing their skills in practical work and problem resolution. Besides reinforcing their professional know-how, increasing the diversity of exhibits in the exhibition hall, and offering the public the thrill of hands-on scientific experience, the movable exhibits can be provided to elementary schools and junior high schools as teaching aids in the future.

- (1). Water Droplet (Cam Mechanism Application): Industrial cam mechanism is used to present the interactive exhibit. Lighting effects are applied to complement the exhibit and accentuate its overall aesthetics. It can be exhibited in conjunction with related activities in the future to showcase NSTM's maker potential and increase the appeal of the activities.



Water Droplet (Cam Mechanism Application)

- (2). Angel of Transmission (Mechanical Transmission Principle): The exhibit involves the application of computer aided design software to produce mechanical components such as cogs and connecting rods using wood, acrylic and a laser engraver. After the components are assembled, the cranking of the handle by hand powers cogs with different gear ratios to generate rotational force that in turn drives various connecting rods. The visitors will be able to understand the principle of mechanical transmission by operating the exhibit.
- (3). Maglev Vehicle (Magnetism): Attraction and repulsion between magnets are used to levitate the object in the air without any other external force. Magnetism is applied to resist gravity, allowing the object to levitate in the air without being affected by gravity.



Angel of Transmission (Mechanical Transmission Principle)



Maglev Vehicle (Magnetism)



3. Incorporating the maker spirit into permanent exhibitions to create a diverse visiting experience

In 2018, NSTM True Dream Land was combined with various permanent exhibition halls to organize creative DIY activities in order to breathe new life into the exhibits and transform people's museum visiting experience. New knowledge, techniques, and technologies are embodied in permanent exhibitions to highlight the museum's assisted learning functionality, thereby creating a varied, interesting, and educational visiting experience for the public and attract more people to visit NSTM, including potential customers who have yet to set foot in the museum.

For instance, "The Story of Taiwan Agriculture" organized the

Premium Farm Product Tasting Lecture, Kaohsiung One Day Farmer Maker Academy, and Farm Handicraft DIY Courses; the "Fantasy" exhibition hall organized Air Communication, Flower Arrangement, Coloring Reusable Bags, and Flipbook Animation; The Science of Cooking, Unikids Baking, Richage, and Tse-Xin Organic Agriculture Foundation co-organized a series of culinary classes "Pavilion of Dream Transport" organized Digger and Excavator, Secret to Moving Forward: Small Boat Assault; "Open Sesame Science Exploration Center" organized Magic of Light : Secret Password Card and Flying Seeds; "Science Laureates" organized UV Detection Wristband, Hemoglobin Hologram, and Buckyballs Paper Model; "Recovery and Reconstruction After Morakot" organized several ecological education DIY activities and soil and water conservation lectures.



Diseases Prevention Combat Camp:
Mosquito Trap DIY



Science of Cooking: Culinary Class



Earthquake Education Experience Area:
Quake-resistant Architecture DIY



In addition, the Exhibition Division drew upon the theme of Explore IoT Exhibition to launch the inaugural DIY-Drones 2-day summer camp. A total of 18 camps were organized for 106 participants. Questionnaires administered revealed that the participants' overall satisfaction towards the camp reached 94.76%. By planning and implementing the summer camp, NSTM was able to accumulate experience and devise a set of SOPs for implementing exhibition and educational activities. In 2018,

the permanent exhibition halls held over 300 events in conjunction with makers, creating diversified visiting experience for the public.



Pavilion of Dream Transport: Secret to Moving Forward - Small Boat Assault



Open Sesame Science Exploration Center: Secret Password Card



Fantasy: Air Communication



The Story of Taiwan Agriculture: Black Fungus Lecture



Explore IoT Exhibition: Summer Camp-DIY Multirotor Course



Collaboration Exhibitions

1. Color Gallery

NSTM co-organized the Color Gallery with udnFunLife at the 4th and 5th special exhibition hall. As an original exhibition in Taiwan, 15 colors are used to define 15 living scenarios, matching creative colors with living space. Nearly NT\$10 million was invested to create the fantastic setting, where distinct colors are applied for different exhibition areas. Furthermore, the vast expanse of single-color walls are created to complement the gigantic, intriguing installations, taking visitors to embark on a colorful journey. Whether it is the

vibrant, adorable balloon gallery, pinkish girl's cloakroom, vivacious yellow breakfast shop, navy blue MRT that appears to be under the sea, dream-like bird cage garden with violet flowers, blue ball pit that evokes the inner child within us, and Kaohsiung's exclusive betel nut exhibition area, which features a stunning design to symbolize the warm hospitality of people in South Taiwan. The spectacular colors make each scene the perfect backdrop for taking awesome photos, suitable for adults and children alike. The exhibition was held from June 9 to August 26, 2018.



Opening ceremony of the Color Gallery



Kaohsiung's exclusive betel nut exhibition area



The use of reflectors evokes the illusion of floating in the galaxy



2. Rice is Life

Rice is one of the main staples in the world. Besides keeping the people fed, it has evolved into a plethora of unique rice products, with many regions developing their exclusive or similar cultural characteristics. In addition, as technologies and techniques in various regions gradually advance over the years, we are confronted by issues such as climate change and food security, hence the future development of the rice industry is becoming increasingly important. In collaboration with ASPAC members (National Science Museum Thailand and Singapore Science Centre), the joint-

exhibition hopes to incorporate the diverse development conditions of rice and the creativity of various members to present the future outlook of rice in fields such as science, culture and industrial development. The exhibition was held from November 29, 2018, to March 3, 2019.



Exhibits showing rice products from everyday life

3. Understanding Drugs : Uncovering the Truth about Drug Addiction

In promoting drug abuse prevention, MOE and CTBC Anti-Drug Educational Foundation co-organized “Understanding drugs : Uncovering the Truth about Drug Addiction” at the circular courtyard of NSTM (B1F). Through interactive technology and affective experience, such as the Drug Dealer Video Booth, which allows visitors to understand how drug dealers target people and entice them to take drugs. Moreover, the brain cross-section interactive installation lets people understand the adverse impact of drugs on the human brain, in turn promoting the concept of staying away from drugs. The exhibition not only allows the public to gain a comprehensive insight into drugs, but also serves as a reminder of the irreversible harm drugs can cause! It is hoped that



Opening ceremony of anti-drug educational special exhibition



the exhibition's interactive technology, virtual experience and case studies can let anti-drug awareness become deeply ingrained in people's minds. Besides forming the correct anti-drug awareness among students and their parents by imbuing additional drug-related knowledge in them, the public will be able to see the gravity of the drug problem and strive to resolve it. The exhibition was held from April 27 to July 31, 2018.

4. Vanguard for Foreign Relations Science and Technology International Cooperation: An Exhibition of Achievements

Co-organized by NSTM, MOFA, MOST and MOE, the exhibition was unveiled in the National Taiwan Science Education Center in Taipei on June 26, 2018, and relocated at the atrium on the first floor of Wenxin building, Taichung City Hall on September 18. The exhibition was held in NSTM's 3rd special exhibition hall from December 14, 2018, to April 7, 2019. The exhibition features 6 major interactive exhibits, transforming the audience into vanguards for foreign relations, and allowing them to learn how Taiwan has contributed towards international cooperation using satellite and remote sensing technology. The exhibits showcase Taiwan's achievements in homeland surveillance and disaster prevention in 2 central American countries: Nicaragua and Honduras, encompassing fields in satellite technology, GIS, and environmental conservation etc.



Opening ceremony in Taipei



Opening ceremony in Taichung



Opening ceremony in Kaohsiung

3D Theater

1. Formed the film selection team to choose the most outstanding 3D films of the year

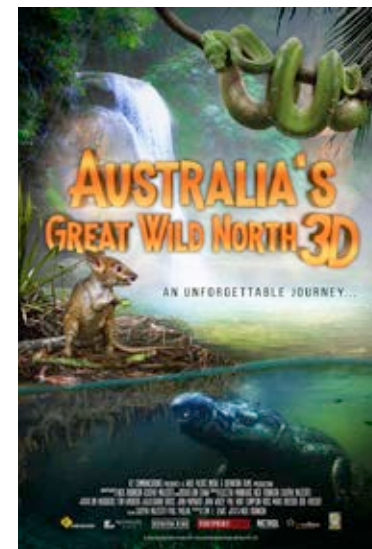
With the film selection mechanism, the volunteers and NSTM staff have formed a film selection team to choose the best films of the year. In 2018, four 3D films were selected, namely Conquest of the Skies, Gamba: Ganba to nakamatachiGamba, Australia's Great Wild North, and Dream Big: Engineering Our World. Besides science and education-related contents that can complement NSTM's environmental education, entertaining and informative animation films ideal for the entire family are also provided for the viewing pleasure of the public.



Conquest of the Skies



Gamba: Ganba to Nakamatachi



Australia's Great Wild North



Dream Big: Engineering Our World



2. Hardware upgrades made to the 3D Theater

Hardware upgrades were made to the 3D Theater. The new equipment features an integrated projector and player to effectively save manpower. In addition, the digital video file format supported was increased, thereby boosting the system's overall performance and upgrading the service quality of the 3D Theater.



Hardware upgrades made to the 3D Theater

3. Development of the “alternative content” service project for the 3D Theater

In supporting the Government Service Upgrade Program and providing comprehensive citizen-oriented services, as well as to uphold the spirit of Fair Share, Participation and Cooperation, and Openness and Transparency, NSTM provided English movies for the first and second screening on every Sunday during March and September of 2018, catering to the need for bilingual services. Innovative service was introduced to the 3D Theater by offering English movies (English with Chinese/English subtitle). Materializing NSTM's philosophy of integrating science into daily lives, and integrating daily lives with scienceBringing Technology Closer to Life and Improving Life Via Technology as well as science experience and experience science to offer the public outstanding educational and recreational environment.



Performance of Services Outside the Museum

High quality touring exhibitions curated by NSTM are held domestically and abroad

1. "Nanometer: The Invisible Scale" relocated to Kinhu Gymnastic in Kinmen County, Howard Beach Resort Kenting, and Tainan Children's Science Museum

Nanotechnology has been developed for many years, and there have been many new products introduced to the market in the name of nanometer. Though this and other related terms are familiar to the public, they may have scant knowledge about the scientific principles and characteristics of nanotechnology. With the support of the Nanotechnology Human Resource Development Program, we held a special exhibition focusing on DIY and personal experience from the perspective of the public. Packaging and conversion were used in the exhibition to make nanotechnology more comprehensible and acceptable to visitors and facilitate its promotion as a popular technology. In 2018, the high-quality itinerant exhibition was held in Kinhu Gymnastic in Kinmen County, Howard Beach Resort Kenting, and Tainan Children's Science Museum from September 22, 2018, to September 1, 2019. The aim is to promote nanometer

education for school children in remote townships.



Kinhu Gymnastic in Kinmen County



Howard Beach Resort Kenting



Tainan Children's Science Museum



2. Beauty Power : Time Corridor of Taiwan Women's Fashion, 1888-2018

For this year's International Women's Day, Taipei Economic and Cultural Representative Office in the U.S. invited NSTM to organize Beauty Power : Time Corridor of Taiwan Women's Fashion, 1888-2018 at Twin Oaks in Washington on March 8, 2018 and the Culture Center of Taipei Economic and Cultural Representative Office (TECRO) on March 10, 2018 (EST). Models took to the runway to showcase the transition and features of women's clothing in Taiwan since the Twin Oaks was founded 130 years ago in 1888. Dignitaries attending the function include over 80 important political figures in Washington D.C., scholars, ambassadors of various friendly nations to the US, and journalists. For the first time, the exhibition has combined Twin Oaks with Taiwanese tradition, fashion technology

and cultural elements, garnering wide praise from the guests.



Models took to the runway to showcase the transition and features of women's clothing in Taiwan

3. Relocation of The Forest and Me exhibition to Chongqing Science and Technology Museum

The Forest and Me is a collaboration by NSTM; the School of Forestry and Resource Conservation, NTU; and the The Experimental Forest, College of Bio-Resources and Agriculture, NTU. In the exhibition, the Sustainable Management of Forests, the Trace of Years in the Annual Growth Rings, and the Application of Natural Resources in Man's World were presented in the form of an immersive experience with media exhibitions of real-time interactions, and theater participation. In 2018, NSTM received an invitation to hold an exhibition at the Chongqing Science and Technology Museum, which accumulated a total of 445,071 visitors, demonstrating the Taiwanese museum's quality and capability by replicating the exhibition overseas. The collaboration strengthened

mutually beneficial interactions between the 2 science museums. The exhibition was held from January 1 to June 2, 2018.



Opening ceremony of The Forest and Me exhibition at Chongqing Science and Technology Museum



4. Co-organized Soil and Water Conservation for Disaster Prevention with Anyang Municipal Museum

After the successful experience of co-organizing the Ancient Lock Exhibition with NSTM, Anyang Municipal Museum in Henan Province, China invited NSTM to co-host the Soil and Water Conservation for Disaster Prevention exhibition, which was held at Anyang Municipal Museum from May 12 to December 31, 2018. The aim was to exhibit NSTM's collection and promote popular science education under the theme of disaster prevention. By developing and organizing interactive exhibit design, science DIY and science demonstrations, the exhibition has successfully created an in-depth experience for the visitors, receiving widespread praise. At the same time, NSTM has incorporated cultural and creative merchandise into our exhibitions, demonstrating NSTM's cultural and creative functions as a modern museum.



Guided tour during the opening ceremony



Visitors participating in the Water Cycle and Water Resource Protection Science Education activity



Visitors participating in the science DIY activity



5. MOE's New Southbound Policy for Popular Science Education and International Exchange Project

(1). Invention Exhibition relocated to Tech Dome Penang in Malaysia and National Science Museum Thailand

In supporting the government's New Southbound Policy, NSTM relocated the Invention Exhibition to the Tech Dome Penang in Malaysia from October 1, 2017, to February 28, 2018, making it the first collaboration between NSTM and New Southbound Policy countries. During the process, the Tech Dome Penang also utilized local creativity and vitality to develop exhibition manuals and arrange comprehensive educational activities. The exhibition was well received by the local residents in Malaysia. At the end of the exhibition, further collaboration was sought with the National Science Museum Thailand by relocating the Invention Exhibition there from June 1 and October 31, 2018. During the collaboration, the science museum also applied local creativity and vivacity to organize the "I Love Invention" Exhibition.



Tech Dome Penang: Photo of school children posing with the exhibits



Tech Dome Penang: School children experiencing the creative collage game



National Science Museum Thailand: Photos exhibited



National Science Museum Thailand: Opening and lantern lighting ceremony by the Director-general of both museums



(2). The Diseases Prevention Combat Camp special exhibition
relocated to Tech Dome Penang in Malaysia

In supporting the government's New Southbound Policy, NSTM designed the Diseases Prevention Combat Camp exhibition for Tech Dome Penang in Malaysia from September 1 to December 31, 2018. Through interactive experiential exhibits, Dengue fever and influenza-related knowledge can be introduced in a fun, educational manner. The exhibition is comprised of 5 interactive exhibits and one DIY course. A dengue fever seminar was conducted on September 1 in conjunction with the relocation of the Diseases Prevention Combat Camp exhibition to Tech Dome Penang. During the meeting, Deputy Director-general Pei-hsiu Wu presented a speech entitled "How Science Museums Promote the Prevention of Infectious Diseases: The NSTM Experience".



Opening ceremony of Diseases Prevention Combat Camp at Tech Dome Penang



Dr. Facila from the Penang Health Department (second from left), NSTM Deputy Director-general Pei-hsiu Wu (third from left), USM School of Biological Sciences Director Mr. Adanan Che Rus (third from right), NSTM Director-general Shiun Shyang Chen and Dr. Te-pin Chang from the National Health Research Institutes (NHRI) presenting their speech.



Opening ceremony at Tech Dome Penang was hosted by Deputy Chief Minister of the State of Penang Ramasamy Palanisamy



6. Invention Exhibition Relocated to Fengtian Temple in Songshan

Fengtian Temple in Songshan is dedicated to public welfare. In particular, it has opened the gallery to become the only temple in Taiwan equipped with an art gallery, and it is also the only temple in the country that has forged collaborations with the National Palace Museum, National Museum of Natural Science, and NSTM to promote arts, culture, education and popular science. From January 29 to June 24, 2018, the temple collaborated with NSTM to host the Invention Exhibition.



Invention Exhibition Opening ceremony at Fengtian Temple in Songshan.

7. Science and Technology for Disaster Reduction was relocated to Kili Bay Pearl Milk Tea Cultural Center in Yilan County

The exhibition is co-organized by NSTM and related national disaster prevention agencies (including the National Science and Technology Center for Disaster Reduction (NCDR); the Soil and Water Conservation Bureau, Council of Agriculture, Executive Yuan; and Water Resources Agency, MOEA) under the supervision of the Office of Disaster Management, Executive Yuan, MOE, and MOST. Using the folktale Handsome Monkey King in the Journey to the West, characters such as the Clairvoyant, Clairaudient, Sea King, and Earth God are combined with disaster prevention technology exhibits to let the public blend into the world of disaster prevention technology. In 2018, NSTM collaborated with Kili Bay Pearl Milk Tea Cultural

Center in Yilan County to host an exhibition for the first time, hoping to learn disaster prevention-related knowledge with the local community, and how to respond to emergencies in the future.



Science and Technology for Disaster Reduction exhibition opening ceremony at Kili Bay in Yilan County.



8. Globalization Under the Eaves: Marriage Immigration in Taiwan was relocated to the National Library of Public Information

As an immigrant society, Taiwan is grateful towards new immigrants for enriching the culture of the country over different generations. Faced with accelerated globalization, everyone has the opportunity to become an immigrant or migrant worker, therefore if we can embrace diversity, fairness, and respect people from different regions in the world, we will be able to hold our head up high as global citizens. The exhibition is divided into 5 themes: Introduction, World in Taiwan, Localization is Only a Matter of Time, Taiwan Commonwealth, and Home away from Home. The exhibition was held at the National Library of Public Information in Taichung from June 15 to December 23, 2018.



Visit by 4th and 5th graders from Changhua Fenglun Elementary School



Exhibition venue



True Dream Land

In 2018, NSTM's True Dream Land continued to promote maker-related events by creating a maker-friendly environment and implementing the philosophy of hands-on experience and training science enthusiasts. Achievements in 2018 include:

1. Organize quarterly maker curriculum:

NSTM has provided a wide selection of diverse hands-on courses and activities to the visitors. In total, 176 classes were held for 2,518 participants.



Jigsaw experience



Laser engraved pen holder



3D printing pen : Halloween special (pumpkin surprise box)



2. Develop maker community

Co-organized events and courses with maker communities such as Oriental wood workshop, Alace workshop, Open the Box, Being in Luck, Attic Art, and Maker Inn, etc., to promote maker services via the concept of a maker platform, thereby achieving sustainability.



Open the Box (castle piggy bank)



Being in Luck (flip flops)



Maker Inn (glass pen holder)



Attic Art (pet crayon etching)



Alace workshop (hard embroidery and lace ornament)



3. Organize workshops

Organized one round of K-12 Education Administration teachers' workshop for elementary and junior high school teachers' in remote townships (teaching aid production: wooden pinball machine), one round of workshop for the Department of Special Education, National Pingtung University (teaching aid production: wooden pinball machine), and one event for Autism Association (autistic children's learning camp: wooden pinball machine). One round of 2018 Local Disaster Prevention Education Teaching Material and Teaching Aid R&D Course was held.



K-12 Education Administration teachers' workshop for elementary and junior high school teachers' in remote townships



2018 Local Disaster Prevention Education Teaching Material and Teaching Aid R&D Course

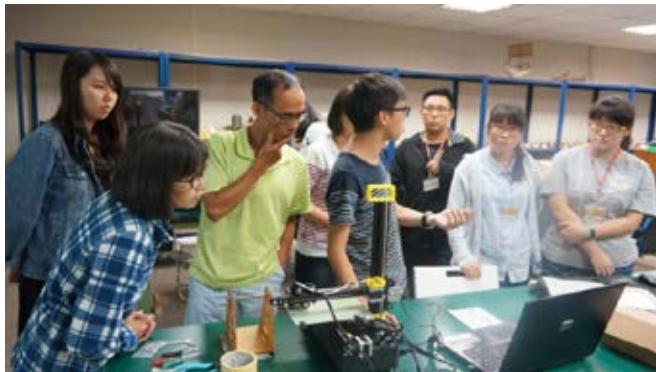


Workshop for the Department of Special Education, National Pingtung University



4. Organize teachers' education course

Organized 2 rounds of Makeblock programming software skill improvement courses (12 courses per round), 3 rounds of machining creative course (6 hours per round), one round of 3D printing and assembly (12 hours).



3D printing and assembly training



Makeblock programming software skill improvement course

5. Establish maker learning system

Collaborated with JYiC.net to create a maker learning system (duration: 1 year), which was activated in June. NSTM developed 2 courses and applied them to the Makeblock training course, accumulating a total of 60 users.

6. Management of the True Dream Land Facebook page

Since the True Dream Land Facebook page was launched on November 21, 2015 (www.facebook.com/nstm.maker), the number of fans has risen steadily, reaching 2,568.



Facebook page of True Dream Lane



7. Let's Go, Maker! 2018 Maker Expo@NSTM:

Since NSTM started True Dream Land in 2015, it has been committed to promoting maker-related events, including the annual NSTM Makers' Fair. This year, the Let's Go, Maker! 2018 Maker Expo@NSTM was held over September 8 and 9, where over 30 workshops from throughout Taiwan were solicited to join the fair. The vast range of exhibited items include woodcraft, papercraft, knitting, illustration, creative models, 3D printing, coding, and ceramic art. Furthermore, 6 talented makers were invited to organize 6 workshops with the following themes: Lace creation (AlaceAlace workshop), laser engraving creative handicraft DIY (Open the Box), homemade lightsaber (PandaSpectrum), AI video game (Flag Technology Co., Ltd.), dried-flower cell phone case (Rubilization), and science through creative cogs (Gigo Toys). Besides displaying maker exhibits, visitors are also invited to participate in the hands-on experience. On September 7, 3 maker experts from different fields, including Professor Tsung-i Lin from STUST, Assistant Professor Kuo-wei Li from NKUST and TO.GATHER founder Hsiang-wen Yang, all presented stimulating lectures and encouraged the sharing of experiences in order to attract more maker-related organizations. It is hoped that the integration of internal strengths and external community resources will facilitate the creation of a maker ecosystem for the general public.



Opening ceremony of the Maker Expo



Making dried flower cell phone cases

Social Resource Integration Achievements

1. Collaborated with the Soil and Water Conservation Bureau, COA, to implement the 2018 Popularization of Soil and Water Field Trip and Diverse Promotional Plan

(1) . Soil and Water Conservation and Debris Flow Prevention Area

The area's educational activities include Soil and Water Conservation Go! Teaching aid demonstration activity (twice every Saturday; reservation is available to schools on workdays), Decoding Game teaching aid experiential activity (available during NSTM's opening hours). In total, 535 events were conducted for 4,549 persons.



Teachers and students from Kaohsiung City Yancheng District Zhongxiao Elementary School participating in the Soil and Water Conservation Go! activity



(2). Relocation of the Soil and Water Conservation for Disaster Prevention exhibition

NSTM collaborated with the Soil and Water Conservation Bureau, COA, to hold the Soil and Water Conservation for Disaster Prevention exhibition. Consisting of 8 interactive exhibits, the exhibition introduces Taiwan's terrain characteristics, slopeland conservation, river dredging, landslide restoration, surveillance system, and soil and water conservation and disaster prevention-related knowledge, etc. Through interesting interaction and simulations, the visitors will be able to benefit from soil and water conservation and disaster prevention-related knowledge. Achievements in 2018 include:

Time	Location	Number of People
2017/11/17 - 2018/4/8	National Library of Public Information	15,798
4/13 - 4/14	Songshan Cultural and Creative Park	8,500
4/16 - 5/31	Hualien Cultural Creative Industries Park	8,991
6/23 - 9/4	Lanyang Museum	22,300
2018/10/5 - 2019/3/3	National Museum of Prehistory	6,230



Opening ceremony at Lanyang Museum



Opening ceremony at National Museum of Prehistory



(3). Promotion and upgrade of mobile teaching aids for soil and water conservation

Mobile teaching aids for soil and water conservation: Storm and Flood developed by NSTM with funding from the Soil and Water Conservation Bureau are made available to all schools throughout Taiwan. In summary, the teaching aids were loaned to 87 schools, 3 organizations, and 25 schools in remote townships to benefit 8,374 people. In supporting the need of this year's program, 55 sets of the Decoding Game, including 20 sets of Storm and 35 sets of Flood were upgraded for the benefit of all schools in Taiwan in the future.



Xinyi Elementary School in Taitung County Chenggong Township



Shanding Elementary School in Taoyuan City Guishan District



(4). Development of innovative teaching aids

The picture book for *Ticklish Tree*, published in 2017, was adapted into a children's film and uploaded to the Internet platform for screening.

Ticklish Tree trailer <http://bit.ly/2KDBoNy>

Complete video of *Ticklish Tree* <http://t.cn/RBxKWIS>



Clips from Ticklish Tree



水保繪本《怕癢樹》
影片完整版請掃我↑



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

The video is co-produced by the Soil and Water Conservation Bureau and NSTM

(5). Soil and water conservation-related staff training and workshop

14 sessions were conducted this year, including 5 Soil and Water Conservation is Fun lectures, 5 school soil and water conservation picture book lectures, 1 school debris flow disaster prevention lecture, and 3 soil and water conservation disaster prevention teachers' workshops, accumulating a total of 492 participants.



Storytelling for children from Xial Tian Di Kindergarten in Hualien City



Lecture title	Date	No. of participants	Location
Soil and water conservation is fun lecture	5/5、5/20、7/6、7/11、8/4	128	NSTM
School soil and water conservation picture book lecture	5/22(2 sessions)	90	Hualien City ◆ Xiao Tian Di Kindergarten ◆ Mingyi Elementary School
	5/25	45	Darong Elementary School
	6/7(2 sessions)	87	Hualien County ◆ Zhuoxi Township Zhuoxi Elementary School ◆ Taiping Elementary School
School debris flow disaster prevention lecture	7/19	17	Kaohsiung City Qiaotou District Chiautou Elementary School
Disaster prevention teachers' workshop	8/13	20	NSTM True Dream Land
	8/29	70	Taipei City Neihu District Bihu Elementary School
	10/24	11	Changhua County Changhua City Shipai Elementary School
Debris Flow Disaster Prevention Knowledge and Innovative Technology teachers' workshop	9/26	24	NSTM



Soil and water conservation picture book lecture held at Taiping Elementary School in Zhouqi Township, Hualien



Leading the children to sing and dance with Soil and Water Conservation Warriors, allowing them to appreciate the spirit of soil and water conservation.



2. National Mosquito-Borne Diseases Control and Research Center of NHRI's 2018 Dengue Fever Prevention Education Area Operation and Grassroot Promotional and Educational Program

NSTM collaborated with the National Mosquito-Borne Diseases Control and Research Center of NHRI to implement the 2018 Dengue Fever Prevention Education Area Operation and Grassroot Promotional and Educational Program. The Disease Prevention Combat Camp permanent exhibition hall is used as the base to conduct Dengue Fever and mosquito-borne diseases control education and promotion. In 2018, the following were achieved:

(1). Dengue Fever Prevention Education Area

In NSTM's Disease Prevention Combat Camp, an observation section has been created in the Mosquito-Borne Diseases Control Area, enabling visitors to observe mosquito specimens, while exhibits and interactive games are employed to introduce the infection route, symptoms of Dengue Fever, as well as topics such as eradicating the vector breeding sources and personal protection against mosquitoes. The visitors may collect Life Combat Cards to take on the challenges and accumulate points in the exhibition area.



Plenty of elementary and junior high schools visit NSTM during weekdays



NSTM staff explaining the rules for using Life Combat Cards



(2). DIY activities

In the summer, NSTM organized 2 DIY courses, namely Mosquito Trap DIY and Mosquito Repellent Academy : Simple Soap DIY, allowing the visitors to produce contraptions that can be used to repel mosquitos using simple materials. In total, 16 Mosquito Trap DIY and 8 Mosquito Repellent Academy : Simple Soap DIY courses were organized for 312 participants.



Visitors attending the Mosquito Trap DIY course

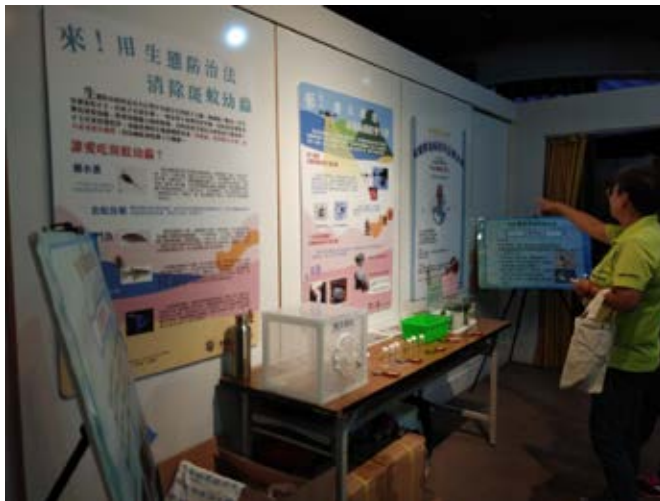


Families learn to make simple DIY soaps



(3). Unveiled disease control technology exhibition : Technology and future of mosquito-borne disease

UAVs (drones) and UGV with tracks are used to detect vector breeding sites, while the latest disease control technologies including SkyNet, mosquito-repellent textile technology, pheromone and ecological pest control techniques are all displayed in the Thumb Theater.



The staff explained the usage of life combat cards

(4). Promotion of Dengue Fever Prevention Mobile Teaching Aid

Dengue Fever Prevention Mobile Learning Kit : Exterminator Squad was loaned to elementary and junior high schools free of charge in an effort to promote the concept of mosquito-borne disease prevention. Mails were delivered to schools throughout Taiwan to promote the awareness in remote townships, so that students can learn and have fun at the same time using interesting teaching aids. In total, 75 schools and one organization applied to borrow the teaching aid. As of November 21, the teaching aid has been loaned to 69 schools, including 25 schools in remote townships.

Second semester of 2017

39 schools and one organization
Used by 5,271 students

First semester of 2018

36 schools
Expected number of users is 6,404



Students diligently completing their assigned missions for the Exterminator Squad



(5). ASPAC Award

NSTM's Dengue Fever Prevention Mobile Learning Kit :
Exterminator Squad received ASPAC's Award for Creative Science Communication on September 6 at the 2018 ASPAC annual meeting, sharing our experience in teaching aid with other countries in the Asia Pacific region.



Exterminator Squad Mosquito Combat Squad received 2018 ASPAC Award for Creative Science Communication



NSTM Deputy Director-General Pei-hsiu Wu, assistant Pei-ting Hsueh, exhibition hall manager Shih-Wen Kao, and Dr. Te-pin Chang from NHRI Receiving award at the National Taiwan Science Education Center



3. ITRI: "Innovating A Better Future" exhibition operating plan

Opened in April 2017, Innovating A Better Future is a permanent exhibition hall featuring interactive experiences using tablets created in conjunction with ITRI to introduce 34 of its innovative technologies. As of October 31, 2018, 50,991 visitors have been to the exhibition. The exhibition hall consists of 6 exhibition areas: Circular World, Secret Chamber, Interstellar Concourse, Time Terminal, Health Window, and Smart Living. Visitors can accrue points by completing different missions to be promoted from Intern status to Researchers of Tomorrow. An Appointment with Researcher event is held for members with Researcher status or above; each year, the highest ranking Researchers of Tomorrow will be able to join the Researchers of Tomorrow Adventure, an in-depth experience at ITRI in Hsinchu. In order to improve customer retention as well as the brand awareness and brand value of ITRI among the general public, 3 new exhibits will be added by the end of this year.



Researchers of Tomorrow Adventure : Visiting ITRI in Hsinchu



Please refer to the following table for event performance in 2018

Date	Event name	No. of participants
February 24, 2018	An Appointment with Researchers 2 Toxin-free sapling technology introduction and tea tree product DIY	25
April 21, 2018	An Appointment with Researchers 3 Challenge from Future U	41
July 2018	ITRI Month	103
July 20, 2018	An Appointment with Researchers 4 3D Printing: Print to Get	52
August 13, 2018	Researchers of Tomorrow Adventure	32
September 26, 2018	Teachers Workshop Blending innovative technology (microbit) into nature and living technology	19
November 17, 2018	An Appointment with Researchers 5 Mixed Reality: Subverting Future Imaginations	38
November 2018	Acer Month	356
November 2018	NSTM Anniversary Month	234



Meeting with researchers: MR beyond your future imagination

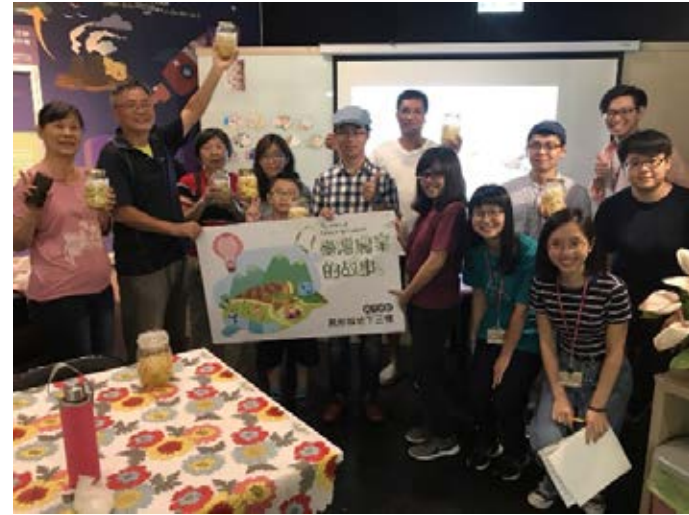


4. The Story of Taiwan Agriculture : Rural Rejuvenation Promotion Program

NSTM implemented this program in cooperation with the Soil and Water Conservation Bureau of COA, Executive Yuan, to promote the development of quality agriculture and the rural rejuvenation achievements in Taiwan by using The Story of Taiwan Agriculture exhibition hall as the basis. In addition to updating the Taiwan Fine Agricultural Products Showcase in 2018, NSTM provided handicraft DIY courses in rural areas, cultural and creational courses for rural makers, and lecture courses provided by agricultural experts as well as teaching aid development. As of November 30, 1,807 persons have taken part in the event.



President Lai Yu-min of Xinglong Community Development Association Taiping District, Taichung, introduced the community to the public



On July 28, NSTM invited Building a Dream Hometown Cultural Industry Development Association from Shanlin District, Kaohsiung City to organize Lemon Enzyme DIY as well as lemon cake and dried lemon tasting activity



5. Disaster Prevention: Let's Go and the Rally of Schools with Outstanding Campuses for Disaster Prevention

In promoting disaster prevention education, MOE and MOI invited various Ministries to showcase their achievements in disaster prevention promotion and experience in building campuses for disaster prevention. The Disaster Prevention Let's Go and the Rally of Schools with Outstanding Campuses for Disaster Prevention Activity was held on April 13 and 14, 2018 (Friday and Saturday) at Songshan Cultural and Creative Parks (warehouse no. 3, 4, and 5). NSTM is the only social education institution co-hosting the event, showcasing AR sandbox for learning about terrain and Dengue fever disease prevention VR teaching aid module, as well as 8 teaching aid exhibits from the Soil and Water Conservation for Disaster Prevention, which was held in collaboration with the Soil and Water Conservation Bureau. The exhibits were extremely popular among visitors.



"Disaster Prevention: Let's Go and the Rally of Schools with Outstanding Campuses for Disaster Prevention" exhibition booths of NSTM

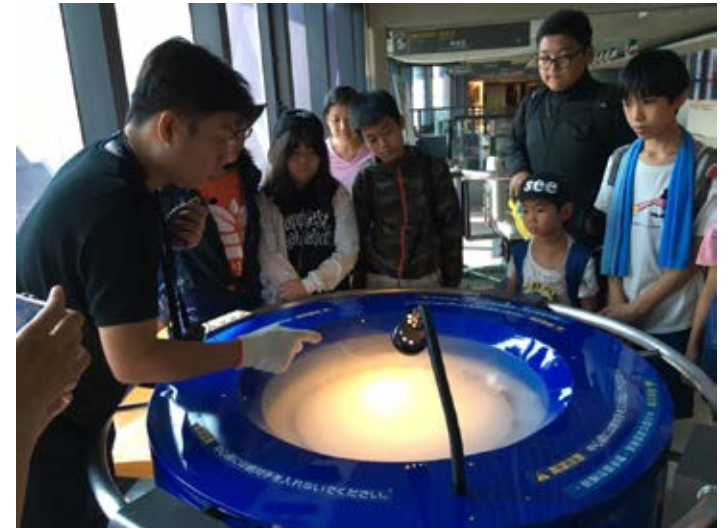


Exhibition area at Songshan Cultural and Creative Park



6. 2018 National Disaster Prevention Day

In supporting the Office of Disaster Management, Executive Yuan's 2018 National Disaster Prevention Day Event, theme of Awakening Disaster Prevention DNA was adopted to hold obstacle challenge activities in conjunction with disaster prevention-related units in Kaohsiung City Government, NSTM disaster prevention-related exhibition halls and private disaster prevention firms on September 21-23. For the first time, NSTM has teamed up with Kaohsiung City Government, Sanlien Education Foundation, and Makrite Industries Inc. to promote disaster prevention concepts and design disaster prevention learning obstacle challenges, allowing parents and children to learn disaster prevention-related knowledge through games, including fire, earthquake, tsunami, large scale collapse, smog, animal and plant related disease prevention, and Dengue fever disease prevention.



Typhoon Scientific Education Demonstration



National Disaster Prevention Day Event : Fire Extinguisher Obstacle Challenge





7. Telecom@Taiwan: Interviewing telecom veterans

NSTM has worked hand in hand with Chunghwa Telecom to collect telecom-related relics and literature for numerous years. However, from the stand point of preserving telecom cultural heritage in Taiwan, merely collecting relics and literature is insufficient, as there needs to be the element of people's history as well. Consequently, NSTM has collaborated with Chunghwa Telecom and TTIDA to plan and promote the project, collecting and documenting the unique experiences of 10 telecom veterans. A professional firm was hired to film the interview and compile a written record. Part of the information will be published on the website, and it will be used as the basis for subsequent information updates.



Interview with telecom veterans and filming of video



Interview and filming of video at Chunghwa Telecom Taichung Branch



8. Road traffic safety promotion by Road Traffic Safety Committee, MOTC and Traffic Police Corps.

(1). 2018 summer vacation motorcycle road traffic safety exhibition hall promotional activity involves a display of police motorcycles by Traffic Police Corps. in the lobby to attract visitors. Besides promoting motorcycle road traffic safety, an interesting pop quiz pertaining to Motorcycle Trip to Fo Guang Shan exhibit at Pavilion of Dream Transport was also carried out on August 10, 11, 14, 15, and 17. A total of 700 people attended the activity.



Motorcycle VR activity

(2). Road Traffic Safety Committee, MOTC organized the motorcycle VR activity on August 23, 2018, inviting 35 visitors from the Motor Vehicles Office nationwide, Directorate General of Highways MOTC, and Institute of Transportation to experience the Motorcycle Trip to Fo Guang Shan exhibit.



Kaohsiung City Police Department Traffic Police Corps. hosted promotional activity



9. Defeat Myopia to Save Vision exhibition area and lecture

In order to liven up "Adventures in Health Land exhibits", NSTM and Kaohsiung Chang Gung Memorial Hospital co-organized the exhibit and activities on May 17, 2018. Exhibits are designed to support current contents in the Adventures in Health Land Hall, featuring interactive and experiential exhibits (micro exhibits) such

as Myopia Puffy Eyes, Vision Test Experience Wheel of Fortune, Vision Passbook Challenge and 10 Minutes After School : 4-Square games on the 4th floor outside the exhibition hall. In addition, 4 myopic-related lectures were held inside the exhibition hall by an ophthalmologist from Kaohsiung Chang Gung Memorial Hospital. The Myopia Halloween activity was also conducted.



Vision Test Wheel of Fortune exhibit



Jam-packed lectures



10. "Millennium Preventive Medicine Series" Lecture

Lectures are held to introduce common diseases in Taiwan and promote disease prevention measures along with the crucial concept of "prevention is better than cure". Furthermore, using exhibits from the Adventures in Health Land Hall, NSTM has collaborated with Taiwan Millennium Health Foundation to host 3 "Millennium Preventive Medicine Series" Lectures, covering topics such as eyes, digestive tract, and osteoporosis. Physicians from major hospitals in south Taiwan were invited to communicate face to face with the public, thereby pursuing a healthy life together.



Jam-packed lectures (presented by Dr. Lein-ray Mo)



Lecture poster

Technology Education





In order to achieve the goal of Science Experience and Experience Science, NSTM has organized myriads of science education activities, where the experiential learning approach is adopted to let the public enjoy the hands-on experience and establish the concept of incorporating science into everyday life. The aim is to materialize the philosophy of integrating science into daily lives, and integrating daily lives with science. In 2018, NSTM hosted 1,450 activities, attracting 278,634 visitors in total. Please refer to Table 9 for the activity summary table. In order to increase students' interest in maker education and to promote the integration and application of cross-discipline science knowledge, NSTM organized technology competitions for junior high school to college students, including the "Hand Launch Glider Flying Competition", "Robot Competition", "Clean Energy Creative Competition", and "Project on Creative Maker Education Competition and Exhibition". The objective is to train the students' design, thinking, and problem-solving skills through the competitions.

In order to promote popular science education, NSTM organized science-themed events according to different age groups. NSTM also set up Scientific Courses for Toddlers and preschoolers. For adults, parent-children and senior groups, NSTM designed the "NSTM Creative Life School" and "Technology Senior Alumni Association". In order to strengthen scientific experiential learning, various science education activities were organized, and interactive experience activities were developed by combining the fundamental concept of science to enhance the fun of learning popular science. The diverse learning model was adopted to promote popular science, where a variety of external activities, seminars, lectures, and other relative activities were held to increase the diversity of the events and expand the scope and coverage of our services.

NSTM is actively engaged in promoting overseas technology



exchange activities, apart from the existing New Southbound countries and China/Hong Kong/Macau, Western Asia (Turkey) is also included to expand the international horizon and forge collaborations. Table 9 illustrates the Number of technology education activities over the past 5 years.

Table 9 Number of technology education activities over the past 5 years

Type Year	Study activity		On-site activity		External service		Lecture		Seminar		Other		Total	
	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants	Sess- ions	Partic- ipants
2014	1,004	36,672	1,270	229,329	139	59,931	36	4,768	1	520	5	1,886	2,455	333,106
2015	765	29,375	906	193,700	157	106,831	40	6,593	2	114	7	185	1,877	336,798
2016	734	26,197	680	197,407	137	99,913	36	4,410	9	298	0	0	1,596	328,225
2017	727	27,370	754	183,507	149	105,858	27	4,961	6	308	34	6,119	1,746	328,123
2018	673	28,582	628	122,193	98	131,955	50	6,304	1	150	88	2,019	1,538	291,203

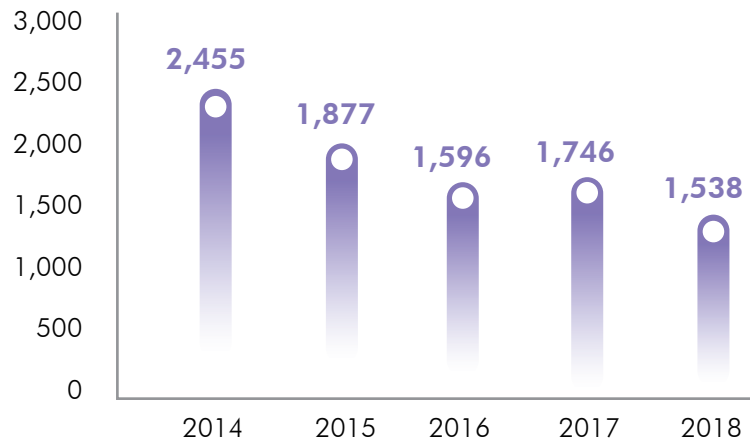


Figure 6 Total number of sessions in the last 5 years

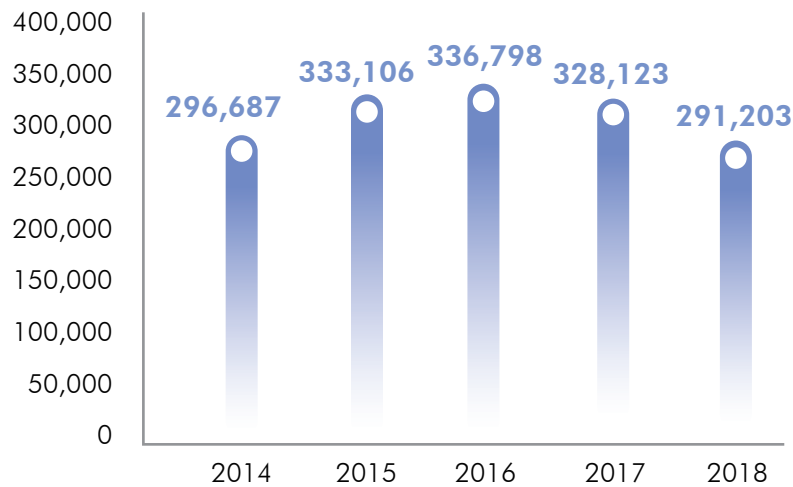


Figure 7 Total number of participants in the last 5 years

Technology Competition

1. MOE subsidizes Clean Energy Creative Competition

In supporting MOE's energy technology promotion policy, NSTM and MOE's Office of Talent Cultivation for the Integration and Application of Clean Energy Systems co-organized the Clean Energy Creative Competition. In promoting the competition's philosophy and explaining the rules, 6 briefing sessions were conducted and participated in by 589 teachers and students from 230 teams. This year's competition features more diverse characteristics, where college students are divided into the Localized Practice Division and Photovoltaics Innovative Application Division, while senior high school and vocational school students are divided into the Practical and Micro Film Division. The competition theme includes clean energy, green circular economy, energy storage or efficiency energy utilization, etc., hoping to embody the concept of environmental sustainability in the submissions. By creating the Micro Film Division, the purpose is to let more students from non-technology related departments take part in the competition via filming, thereby allowing the public to gain insight into the issue of energy technology. 36 winning teams were selected during the final competition on October 7, and awards were presented to 158 students.



2. Commissioned by MOE to organize Project on Creative Maker Education Competition and Exhibition

In order to increase students' interest in maker education and Technology Field, the K-12 Education Administration, MOE, organized the 2018 Technology is So Fun - Maker and Technology Education Carnival and Maker Education Teaching Plan Design Competition, which were co-organized by NSTM and NKNU. The project's achievement exhibition was held on June 2, featuring exhibitions by 22 maker education and technology centers and 21 leading schools in the field of technology. Exhibition areas include the stage (Maker Exhibition Activity), obstacle challenge (Maker Brainteaser), maker workshop (DIY), and maker lecture. The activities provide the visitors

with an opportunity to get involved and experience firsthand the joy and sense of achievement as makers. The 2-day exhibition attracted roughly 9,500 people. The 2nd teaching plan design competition was expanded to include teachers from public and private elementary and junior high schools nationwide. Divided into the elementary school and junior high school category, the competition features 3 major themes: "Life Technology", "Information Technology", and "Emerging Technology" Awareness. In total, about 313 teachers from 161 teams across 6 divisions participated in the competition.



Technology is So Fun - Maker and Technology Education Carnival achievement exhibition



Technology is So Fun - Maker and Technology Education Carnival achievement exhibition opening ceremony



3. 2018 Hand Launch Glider Flying Competition

In honor of the Wright Brothers designing the first manned heavier-than-air aircraft in 1903, as well as promoting aerospace science, NSTM held the 8th "Hand Launch Glider Flying Competition" during 12/15-16 aimed at senior and junior high school students. The event adopted the approach of building and competing on the same day with the categories of "Straight Flight" and "Endurance Flight" while taking into consideration the creativity and scientific principles of flight. It was aimed at training students in developing, designing, thinking, and problem-solving abilities. A total of 525 teachers and students from 150 senior and 135 high school teams participated in the competition.



Endurance flight of 25.43 seconds sets a brand-new record!



Hand Launch Glider Flying Competition - First place in the junior high school group



Hand Launch Glider Flying Competition - First place in the senior high school and vocational high school group



4. FLL Robot Competition

In promotion of cross-industry integration and utilization of scientific knowledge, the international robot competition was organized for students aged 6 to 18, where scientific creativity and competition serves as a platform for the students to demonstrate their ability in technology application and information integration. The objective is to cultivate their confidence, communication and leadership skills in the field of technology and creativity. Furthermore, in order to increase the students' motivation in learning and participating in robotics, Esun Robot Association invited NSTM to co-organize the Taiwan round of the 2017-2018 FLL Jr.(FIRST LEGO LEAGUE JR.) and FLL(FIRST LEGO LEAGUE) creative robot competition. The competition was participated in by a total of 2,500 people, including 710 contestants from 74 teams, including their families and the audience.

2017-2018 FLL Jr.(FIRST LEGO LEAGUE JR.) and FLL(FIRST LEGO LEAGUE) creative robot competition



2017-2018 FLL Jr.(FIRST LEGO LEAGUE JR.) and FLL(FIRST LEGO LEAGUE)



Government Grant

1. MOE subsidized 2018 medium-range project - Robot & Programming interactive classroom and digital learning center establishment and promotion project

In order to improve the technological know-how of the general public and K12 students towards robots and programming, NSTM was commissioned to implement MOE's medium-range project - Robot & Programming interactive classroom and digital learning center establishment and promotion project. A robot classroom and programming classroom were constructed on 2F of the South Complex to develop robots and programming related teaching aids and learning resources. A series of popular science promotion activities were also hosted to encourage the general public and K12 students to become familiar with robots and programming related knowledge and application through non-formal science learning .



Robot classroom



Programming classroom



2. K-12 Education Administration, MOE, commissioned the "2017-2019 Science Education Resource Promotion Program"

Based on the success of the 2016 Science Education Resource Promotion Program, we continued to take the K-12 Education Administration's commission to promote science education with our museum resources from 2017 to 2019, so as to achieve the following three goals: developing and integrating teaching resources, providing students with innovative and convenient learning resources, and enhancing the empowerment and cooperation between teachers. In 2018, NSTM held 29 teacher workshops for a total of 1,027 participants and offered teaching resource packages for 434 classes.

Additionally, we co-organized the "2018 Joint Meeting and Workshop of the Physics Education Society of the Republic of China", the "Boundless Dream – Teacher Get Support, Kids Get Hope Workshop" in Lianjiang County, and the Workshop for designing teaching projects of the Life Curriculum. A total of 107 teachers were trained. Moreover, we held 16 "Amazing Optics" events with the Department of Photonics, National Sun Yat-sen University, with a total of 4,202 participants. 8 hands-on activities of creative popular science were held for 1,537 people in different locations.



Creative Popular Science



Teachers Workshop



3. MOST subsidized the "2017 Project for the Development and Promotion of Robot & Programming Digital Resource"

In order to help everyone learn the principals and experience application of robots and programming, NSTM implemented MOST's "Project for the Development and Promotion of Robot & Programming Digital Resource" through various activities, including building a "Smart Technology - Robots and Programming" platform for knowledge sharing and providing digital resources for interactive learning, managing marketing via social media (such as Facebook and blogs), combining the developed teaching materials, teaching aids, animation and videos to hold DIY experiments, teaching aid experience, teacher workshops and science camps. The "Smart Technology - Robots and Programming" platform is ranked no. 1 on Google Chinese website using keywords such as "Smart Technology" or "Robots and Programming", thereby playing a pivotal role in promoting smart technology, robots, and programming, and digital learning in the Chinese community.



4. MOST subsidized 2018 Museum-Based Innovative Biomedicine Transformation Project: Biomedicine Innovation Popular Science Promotion Program (1/3)

For this program, exhibits and digital materials developed using cutting-edge technology from Museum-Based Innovative Biomedicine Transformation Integrated Project are applied to design innovative popular science teaching materials and teaching aids. By integrating biomedicine exhibits, digital medium, and popular science activities, NSTM is able to expand the influence and benefit of cutting-edge technology on education innovation. The first phase of the program was commenced in August 2018, transforming cutting-edge technology "Near-Infrared Light-Induced CO₂ Generation to Accelerate Wound Healing" developed by Professor Chen-sheng Yeh from the Department of Chemistry, NCKU.

Smart Technology - Robots and Programming knowledge sharing platform website



5. MOST subsidized 2017 "Cutting-Edge Nanotechnology in Museum: Project on Nanotechnology Innovation Education and Promotion"

Implementation of "Cutting-Edge Nanotechnology in Museum: Project on Nanotechnology Innovation Education and Promotion" Theme: UV protection technology. Core concept: Using nanodiamond scattering light and converting UV light into far infrared energy in order to produce sunscreen material that is harmless to the skin. The project has developed teaching material and teaching aids for UV protection technology and using nanodiamond to replace SiO_2 , as well as organized nanotechnology innovation education experience activities and workshops. In 2018, a total of 70 nanotechnology innovation education and promotion activities were held, attended by 10,985 people.



Nanotechnology Innovation Education and Promotion



6. MOST subsidized 2018 Online Technology Short Films' Influence on the Awareness and Attitude of People/Students Toward AI Project

Artificial Intelligence (AI) is a crucial technology in the smart technology industry and smart living applications in the future, and it is gradually affecting our work and way of life, therefore it is imperative to establish the right awareness and attitude about AI among the public and the students. By employing an interesting scenario-based strategy, the project has designed an AI short film that was uploaded to the Internet to try and gain insight into people and students' awareness and attitude towards AI in contemporary society as well as to explore the online technology short film's influence on the awareness and attitude of people/students toward AI, and the factors. Furthermore, practical recommendations will be provided for future online technology films' influence on the viewers' awareness and attitude. Video production, questionnaire design, and survey were conducted this year.



AI technology short film

7. MOST subsidized CSU to assist the science volunteers' "NSTM Science Exploration Let's Go" project

NSTM's abundant collections, guided tours, and diverse science teaching aids are combined to train senior volunteers in conducting science education demonstrations, thereby fostering interactions between senior citizens and younger generations.

(1) Itinerant mobile science classroom

A series of science-related activities have been designed for schools, community centers or libraries in south Taiwan, where volunteers will provide science-related guided tours or DIY activities. The theme of the event is inspired by scientific phenomena in everyday life, with the aim of helping students and people discover interesting aspects of science in life.



(2) Exploring NSTM

On-site activities and science workshops will be held, including "Exhibition Hall Exploration", "3D Movie", "Science DIY", and "Teaching Aid Experience", etc. Volunteers assisted with science guided tours and DIY activities so that the museum visitors can appreciate the convenience in life brought about by technology.

The project aims to go beyond the walls of museums to promote the concept of museum resource sharing, therefore NSTM collaborated with Tainan Traditional Chinese Culture College Foundation to offer students from Tainan an opportunity to visit NSTM and learn. In addition, volunteers from NSTM and Tainan Traditional Chinese Culture College Foundation are also able to interact, sharing NSTM's experiences in science education teaching materials, teaching aid and event planning, etc., so that the foundation can continue to sow the seeds of science education in Tainan. Science DIY activities were organized at Kaohsiung City Library Caoya Branch, facilitating the sharing of resources, and increasing opportunities for people to be exposed to science.

8. MOE subsidized the 2018 Project on Promoting Senior Citizen Self-Directed Learning Group & Lifelong Learning Activity

NSTM promoted MOE's Senior Citizen Self-directed Learning Group & Lifelong Learning Activity Pilot Project and trained potential leader for senior Self-Directed Learning groups. Our professional training helps the potential leaders obtain the qualification. The project includes beginner training advanced training, practice, and evaluation, and enhancement workshops, etc. Moreover, MOE has organized an enhancement workshop in order to help the senior leaders and staffs of self-directed learning groups from the two previous years understand the physical, mental and spiritual learning needs of senior citizens, so as to improve teaching and service quality.



Senior Citizen Self directed Learning Group & Lifelong Learning Activity Pilot Project - Certificate Presentation Ceremony and Exchange Workshop



Social Resources/Caring About the Disadvantaged

1. MOE subsidized the 2018 "Spread Love through Social Education and Help the Disadvantaged to Fulfill Their Dreams - Smart Technology Exploration Project"

In order to elevate the literacy of robot technology among junior high school students in south Taiwan, remote townships and indigenous villages, MOE and Lam Research have funded NSTM to plan and implement the activity. Through mBOT robot experience and hands-on courses, as well as a visit to technology-related exhibition halls and 3D Theater in NSTM, indigenous junior high school students from remote townships are able to learn about robots, programming, and smart technology through diverse experiences, thereby fostering their interest



Smart technology exploration

in smart technology and scientific exploration.

2. MOE subsidized the 2018 "Spread Love through Social Education and Help the Disadvantaged to Fulfill Their Dreams - Fun City Science and Culture Activity Project"

In order to look after students in remote townships and to encourage them to make use of NSTM's educational resources on cultural diversity, we have received a subsidy from MOE to organize the "Spread Love through Social Education and Help the Disadvantaged to Fulfill Their Dreams - Fun City Science and Culture Activity Project". A total of 12 children's science park activities were hosted for 495 visitors.



Event photo



3. Kinghong Foundation sponsored the Multicultural Science Education Program

In order to enhance indigenous school children's awareness of cultural diversity and ethnic costumes, Kinghong Foundation sponsored the 2018 Multicultural Science Education program. A total of 15 activities were conducted for 719 second-generation indigenous students.



Visiting the LOHAS Energy Conservation House

4. Taiwan Telecommunication Industry Development Association (TTIDA) sponsored "2017-2018 EM Radiation Dissemination and Experiencing Activities"

In order to meet the need for EM radiation dissemination and the promotion of the EM radiation exploration area in the Telecom@Taiwan exhibition hall, we received funds from the Taiwan Telecom Industry Development Association (TTIDA) and promoted popular science knowledge of EM radiation. Starting from the experiments and exploration of the electrical and magnetic principles, the activities were held to help people understand the application of EM radiation in daily life and its safety. In 2018, NSTM held 17 activities over 11 days including the promotion at the EM radiation experiment station of "Military Officers and Children" with a total of 4,593 participants. We have also hosted 3 workshops with 79 teachers involved and teaching resource packages for 69 classes with a total of 1,569 participants. Ten senior high school



Teachers Workshop

practical science camps were held for 1,399 students; 7 volunteer training workshops were held for 257 volunteers; and 2 school science camps were conducted for 306 students.



5. TTIDA sponsored project:

(1). 2018 Programming and Smart Technology Experience Project

In order to elevate the literacy of telecommunication technology education among junior high school students in remote townships and indigenous villages in south Taiwan, TTIDA has commissioned NSTM to plan and implement this project.



2018 Programming and Smart Technology Experience Project

Through App Inventor 2 experience and application courses, as well as a visit to telecommunication technology-related exhibition halls and 3D Theater in NSTM, indigenous junior high school students from remote townships are able to learn about programming and telecommunication technology through diverse experiences, thereby fostering their interest in telecommunication technology and scientific exploration.

(2). Mobile Science Experiment Station and Scientific Learning Project-Assisting Science Education in Remote District Schools

In order to strengthen scientific learning and exploration in remote district schools, the integrated method of exhibition and education was adopted, delivering large science teaching aids to schools in remote townships to organize exhibitions



Photo of guests at the opening ceremony of the experiment station



Listen to the difference between a normal megaphone and a megaphone made from springs



Little docent explaining how Morse code is transmitted using a teaching aid



and experience activities. Science experiment stations were established to provide ongoing learning and students can explore scientific phenomenon and engage in hands-on activities by docent training. The aim is to promote popular science education in remote district schools.

To enrich contents in the stations, besides fundamental science teaching aids collected by the Technology Education Division over the years, printing and lock collections from the Collections and Research Division, as well as the metrology promotional project were consolidated. Infusing cultural elements and the concept of technological history, 10 large teaching aid packages across 4 major themes: Electricity and Telecommunications, Metrology, Printing and Ancient Locks were serviced. Science stations were established in 2 Taitung remote district schools. They are open to other schools in the region, expanding the reach of science beyond museum, thereby achieving the goal of resource sharing and optimizing benefits.

The project includes 2 teacher's workshops, 2 students' workshops, 2 opening ceremonies, and 2 experiment stations, servicing a total of 984 persons.

(3). Telecommunication Technology Tour for New Immigrants

TTIDA sponsored the Telecommunication Technology Tour for New Immigrants to improve the understanding of telecommunication technology in Taiwan among new immigrant families and their children. A total of 7 activities were held for 350 people.



Event photo



6. Lam Research Sponsored 2018 Smart Technology Experience Project

In fulfilling their corporate social responsibility, Lam Research sponsored NSTM's robot summer camp and smart technology experience activity organized for the benefit of school children in remote townships. NSTM hosted the Smart Robot Summer Camp Activity for disadvantaged students and students living in remote townships of Hsinchu at Hsin Ke Junior High School in Hsinchu. In June and September, school children from remote townships of Kaohsiung and Tainan were invited to participate in the Smart Robot Experience Activity at NSTM. It is hoped that the summer camp and technology experience activities will be able to provide school children from remote townships and disadvantaged students with equal opportunity to learn about robots and smart technology. In 2018, 3 smart robot activities were held with 197 participants.



Smart robot summer camp activity



Environmental Education

1. 2018 MOE Environmental Education Promotion Project - NSTM Tour

NSTM applied for MOE's 2018 Environmental Learning Center and School Trip Promotion Plan, aiming to provide priority application for the rural primary schools and junior high schools. The plans include Green Discovery – LOHAS Energy Conservation House Tour and Experience and Discover the Environmental Issues exhibition hall. With hands-on courses such as Nature Feast – Frogs in Taiwan, Water Vanguard, and Green Magic-the Flowerpot Clock, we lead students to a better understanding of Taiwan tree frogs and other issues related to ecology, water resource usage, and environmental sustainability. In 2018, NSTM held 10 events with a total of 456 participants.



Event Photo of NSTM Tour

2. The Industrial Technology Research Institute (ITRI) Commissioned NSTM to Organize LOHAS Energy Conservation House Promotion and Volunteer Education and Training Project

Using NSTM's environmentally certified halls in conjunction with the Bureau of Energy, MOEA's Energy-Saving and Carbon-Reduction movement, as well as a demonstration of LOHAS Energy Conservation House exhibit, and lecture activities, we have introduced tips for saving energy to the visitors. In 2018, NSTM held Energy-Saving Partners - Volunteer Alliance Seminars, Saving Energy with A-guang - Winter and Summer Camps, Energy Saving and Environmental Education Courses, and Saving Energy - LOHAS Energy Conservation House Itinerant Exhibition in Remote Townships, and Energy Conservation Popular Science Challenge Activities. Furthermore, in supporting the Earth Day, the Earth Day - Vivacious Wetland Ecology was held at the Dashu Old Railway Bridge Wetland Park, which was attended by 4,345 people.



Energy Saving and Environmental Education Course event



3. 2018 Environmental Education Cross-Industry Integrated Academic and Practical Forum

In order to enhance the public's environmental awareness, achieve environmental sustainability, and materialize eco-friendly actions, the cross-industry, government, and academia approach was adopted to promote environmental knowledge. To improve the understanding and discussion of various relevant issues among the academia and industry, as well as to remain consistent with the 2018 environmental education theme of Developing Local Networks, NSTM organized the Environmental Education Cross-Industry Integrated Academic and Practical Forum, where a keynote speech, practical experience sharing, publishing of dissertations, and visiting environmental education facilities are organized to create a dialogue platform for professionals and practitioners from fields such as environmental protection, business, and

psychology. The aim is to broaden the horizons of environmental education, gain deeper insight into local environmental issues and foster sustainable development.

By organizing the forum, it will generate opportunities for participants from different industries to exchange knowledge and collaborate, as well as encourage participants to get involved in familiarizing themselves with local environmental issues. In turn, it will inspire the public and practitioners to promote cross-industry environmental education, and effectively develop the local network in order to generate synergy for environmental education.

The keynote speech titled Materializing Circular Economy - Starting from Environmental Education was delivered by Professor Shih-chun Liu from the Department of Greenery Technology, National University of Tainan (NUTN). The Chief of Education Promotion Section, Department of Comprehensive Planning, EPA, Executive Yuan Kuo-ting Chou delivered a speech entitled Characteristics of the Environmental Education Act in Taiwan. A total of 16 dissertations were published, and the forum with the topic "How to Materialize Environmental Education Philosophy and Promote Its Practice" facilitated practical experience exchanges between participants from different industries. A total of 150 people participated in the event.



Group photo of participants



4. EPA, Executive Yuan's 2018 Environmental Day and Environmental Education-Related Project - LOHAS Energy Saving Initiative

NSTM has applied for EPA, Executive Yuan's 2018 Environmental Day and Environmental Education-Related Project - LOHAS Energy Saving Initiative. Utilizing NSTM's diverse teaching resources, we have organized environmental education-related activities in

conjunction with World Environment Day and International Day for the Preservation of the Ozone Layer. Environmental science DIY activities were held to increase people's environmental awareness so that they can learn how to take advantage of clean energy and develop attitudes and conduct that will help cherish the Earth's resources. A total of 4 workshops and 2 DIY experiences were organized for 580 visitors.



Solar powered car production



Producing eco-friendly batteries using potted plants



5. Water Resources Agency, MOEA's 2018 Sustainable Environment - Water Conservation Expert

NSTM has incorporated local environmental issues and geographic conditions in conjunction with the theme of Water Environment to apply for funding from the Water Resources Agency, MOEA for the sake of organizing the Cherish Water promotional campaign. Through interactive teaching aids and experiments, water environment education is transformed into interesting obstacle challenge games in order to increase awareness of water resources among students and the public. It is hoped that the lively, interactive teaching aid experience in the form of edutainment will be able to raise people's awareness in cherishing our water environment. In 2018, 18 activities were held and participated by 4,714 people.



Cherish Water promotional campaign



Water resource pop quiz



Cherish Water promotional campaign



Popular Science Lectures

1. Meeting the Scientists on Sunday Science Lecture

In order to promote scientific literacy for the public, MOST has subsidized NCKU, NSTM, National Kaohsiung University of Applied Sciences, and the National Center for High-Performance Computing for holding scientific lectures since 2003. In 2018, NSTM organized 16 Meeting the Scientists on Sunday Science Lecture at the South Complex International Auditorium with 4,108 participants in total. The lectures were live-streaming and available online for those who could not join in person.



Event photo of Sunday Science Reading Master lecture

2. Health Science Master at NSTM lectures

In recent years, global warming has evolved from scientific research into an international political issue, but the majority of the public still lack in-depth knowledge of climate change. We co-organized the "Health Science Master at NSTM" project with the Taiwan Association for Promoting Public Health in 2018. Under the premise of professionalism, science, and functionality, lecturers from respective disciplines were invited for different lectures. Furthermore, technology-related environments and venues are combined to convey correct knowledge pertaining to climate change, so as to let the public become familiar with the topic of climate change. In order to improve the event's benefits, videos of lectures are posted on the website to expand the diversity of the learning medium and propagate climate change-related information. The concept of technological lifestyle was incorporated, hoping to raise the public's awareness of climate change,



Event Photo of Health Science Master at NSTM lecture

thereby realizing the function of social education and allowing the public to understand the importance of climate change's impact. A total of 5 lectures were held for 542 participants.



Technology Education Activity

1. 2018 Weekend Science Feast (spring class and fall class)

In order to cultivate basic scientific knowledge and discipline of students, NSTM has integrated applied science resources to develop science courses, including biological experiments, robotics, astronomy, power machines, aesthetics and crafts, children's creative arts, physics, and chemistry, etc. Furthermore, 5% of the vacancies were reserved for specific student groups, and weekend courses, such as the Weekend Science Feast, were held from March to June and from September to December (spring class and fall class). In 2018, NSTM held 84 sessions and served 1,143 participants in total.

2. 2018 Summer and Winter Camp

In order to enrich the lives of students during summer and winter vacations, NSTM promoted a diversity of science education courses to improve the scientific knowledge and discipline of our national students via a variety of science experiences. These activities include programming, robotics, aesthetics and crafts, biological exploration, astronomy, and other courses. We also offered free learning for the 5% specific student groups. In 2018, NSTM held 197 sessions and served 5,124 participants in total.



Event Photo of 2018 summer and winter camp



3. Reservation of Activities for Schools and Field Trips

In order to improve basic scientific knowledge in students, NSTM planned the NSTM Fun Science hands-on activity series by integrating our experiential exhibits and exhibition hall resources. NSTM Fun Science is available to school and educational groups to conduct field trips (reservation is required). The activities are divided into lower, intermediate, and advanced elementary school levels; junior high school level; environmental education; and education for students with visual and hearing impairments. We aim to serve students from different backgrounds and offer chances for fair, shared learning. In 2018, NSTM has held 208 sessions and served 8,905 participants in total.



Frozen Superconductivity



Experience Halls are Classrooms Health Exploration Hall



4. Popular Science for Toddlers

NSTM has designed a series of popular science lectures for toddlers; by combining NSTM's exhibition halls, the Exhibition Halls are Classrooms customized DIY activities were organized, while exhibition hall guided tours, science DIY and experiments enable toddlers to experience science in person, thereby inspiring their interest in exploring science. In 2018, 16 activities were held for 600 toddlers.

Furthermore, weekend toddlers' popular science DIY activity was designed for families and preschoolers, where science-based games and simple experiments were utilized to stimulate their imagination and curiosity so that they can play and learn interesting science-related knowledge. With involvement from the parents, the children can learn and develop intellectually through the courses. A total of 12 events were held for 181 people.



Toddlers' popular science course

5. Co-organized "Nutrition Knowledger" with Fooyin University

NSTM co-organized "Nutrition Knowledger" with Fooyin University to conduct events and cooking lessons during the holidays at the Modern Kitchen inside the Science of Cooking Exhibition Hall on the first-floor lobby of the North Wing. Diverse nutrition-related knowledge and concepts are matched with edutainment obstacle challenging activities to let the visitors learn more nutrition and food safety-related knowhow effortlessly.



"Nutrition Knowledger" event



The Popular Science Library/Popular Science Communication Center

1. Library Service Statistics

The Popular Science Library is located on the first floor, South Complex, and has an area of 1,350 square meters, with a general reading area and a comprehensive collection area. The reading area provides journals, audiovisual services, and general readings. There are 9 major popular science categories, 5 main topics and displays related to exhibitions in NSTM, allowing the public to conveniently search for books or information based on theme categories. The lobby outside the reading area is reserved for reading newspapers. There is a children's area, popular science comic area, and audiovisual area, making it the first popular science-themed library in Taiwan. In 2018, the theme area was expanded to the entrance of the library, where decorations and lighting allow the visitors to see the theme books as soon as they enter the library.

Through reading materials on popular science, the Popular Science Library is able to let technology take root by becoming the center of living and learning for people. Moreover, it can expand visitors' horizons in education and learning. The library currently

houses a collection of 47,859 books, while activities such as storytelling of popular science, story time, popular science writing class, and popular science lectures are held to promote the reading of popular science materials among all age groups.

Table10 The number of visitors to the Popular Science Library in the last 5 years

Year	No. of visitors
2014	15,850
2015	19,323
2016	27,831
2017	28,111
2018	30,270



Story time in Popular Science Library



2. Popular Science Communication Center

In order to spread science knowledge fast and effectively, to help people judge the correctness of message, to enhance national competitiveness and to achieve the aim of lifelong learning, MOE commissioned NSTM to implement the Popular Science Communication Center Medium-range Program. Using the Popular Science Library as the base to build the popular science communication center, the goals of the Popular Science Communication Center in 2018 are video database upgrade, hardware upgrade, training of popular science communication specialists, and the communication of popular science knowledge. In order to offer the public opportunities to learn popular science-related knowledge, the Popular Science Communication Center procured 982 high-quality popular science videos from Taiwan Public Television Service Educational VOD Online (PTSVID) along with relevant hardware for the viewing convenience of the public, thereby achieving optimal benefits for innovative popular science communication.



High-quality videos from PTSVID

3. Popular Science Reading Activities

In order to promote parent-child reading and learning, and to enhance popular science education for parents, NSTM has utilized the library's abundant resources to promote the Popular Science Library through diverse themes. In 2018, the popular science reading activities including English Scientist Story Camp, Chinese Characters Let's Go, Geometry through Origami, Moving World of Insects, All About Debris Flow, Pokemon Biodiversity Camp, and Paleontology Explorer was held in conjunction with DIY workshops. In order to increase people's interest in reading popular science journals and magazines, science lectures, popular science essay activity, and toddlers' active earning and reading activities were organized. In order to increase the interest in utilizing library resources and to provide diverse alternatives for families, Marble Climbing Steps Scientific Toy and Celebrating the Lantern Festival with Unique-Shaped Sweet Glutinous Rice Dumplings were held.



Popular Science Reading Activity astrology lecture



Overseas Technology Exchange Activity

1. New Southbound :

(1). Tech Dome Penang:

Dr. Khong Yoon Loong, CEO of Tech Dome Penang and Mr. Teng, CEO Penang Youth Development Corporation (PYDC) visited NSTM to discuss bilateral collaborations and organize the first scientific exploration activity, which consists of 46 participants (33 Taiwanese students, 11 Malaysian students, and 2 museum employees from Tech Dome). In total, 15 people attended the second technology exchange workshop (11 Taiwanese students and 4 NSTM staffs), which was held by Tech Dome Penang.

PYDC also attended the 3-year MOU signing ceremony among Tech Dome Penang, NSTM and PYDC. They also visited the University of Science, Malaysia, and M.E.I. Project Engineers Sdn Bhd. and WhyteHouse Education Group to discuss potential collaborations in the future.

(2). Singapore Science-Base Touring Camp

In supporting the government's New Southbound Policy, NSTM co-organized the 2018 Overseas Science Camp in Singapore with Singapore Science Centre, National University of Singapore, and ArtScience Museum.

Targeting families, the event adopts the form of an overseas camp, providing an opportunity for families to embark on overseas journeys, engage in discussions and achieve development together through interactive learning. An exploratory science education approach is incorporated into the educational activities to train related talents and expand their international horizons, in turn generating new added values for tourism.



2018 Wa Sci Overseas Science Camp-
Summer Camp Singapore for families



2. Western Asia

Bursa Science and Technology Centre in Turkey invited NSTM to attend the Turkish Airline Science Expo to observe the country's achievements in promoting popular science. NSTM unveiled the patented bamboo stick rubber band gun shoots floating ball game and Chinese spouting bowl to demonstrate the principle of resonance as part of the museum's science demonstrations. Besides signing an MOU with Bursa Science and Technology Centre, NSTM also visited Istanbul Museum of The History of Science & Technology in Islam. According to official statistics, a total of 192,000 people attended the Turkish Airline Science Expo, and at least 10,200 people visited NSTM's booth, which was widely covered by Turkish media as well.

In order to solidify the long-term collaboration between NSTM and Bursa Science and Technology Centre, we invited the center to co-design long-term science camps, hoping to promote ancient Islamic civilization, such as science, technology, mathematics, and astronomy, to the people of Taiwan via the science camp.



NSTM was invited by Bursa Science Center, Turkey, to attend the Turkish Airlines Bursa Science Festival. Visitors to the festival tried out the floating ball game shooting game using the bamboo stick rubber band gun developed by NSTM.



NSTM Director-general Shiunn-shyang Chen (right) was invited by Bursa Science Center, Turkey, to attend the Turkish Airlines Bursa Science Festival. He also signed a 3-year MOU with CEO of the center Fehim Ferik.



3. China, Hong Kong, and Macau

(1). Nanjing City Phoenix Publishing & Media, Inc.

Nanjing City Phoenix Publishing & Media, Inc. specializes in editing textbooks for junior high school or lower level students. The group invited NSTM to co-organize youth science summer camp activities in Nanjing.

(2). Nanjing Bureau of Education

Nanjing Bureau of Education in China is expected to sponsor 15 science teachers from its affiliated elementary schools to attend the 3rd Teachers' Research Workshop, which was organized by NSTM from December 12 to 20, 2018.



15 visitors from a governmental science education teachers' training center in Nanjing visited NSTM to attend the formal and informal science education workshop co-organized by NSTM.



In 2018, science teachers from Nanjing City Primary School attended the workshop, and NSTM expanded the learning venue to include Kenting National Park to achieve the benefits of edutainment.

Visitor Services





Visitor Services

1. Enhancement of marketing and services to improve the visiting rate

The number of visitors is a key performance indicator of the museum, as well as a demonstration of the performance goals. Faced with the changing environment, besides continuing to update and innovate our merchandise, NSTM also adopted diverse marketing channels by combining social/civil resources, and we are actively developing potential visitors and disadvantaged groups. In terms of visitor services, NSTM has provided a diversity of guided tour services and activities, improved service quality and conducted community events to maintain our customer base, in turn establishing a good interactive mechanism. The audience satisfaction rate was 92.08% this year. Approximately 1,929,030 people visited the museum (inside the museum). The number of visitors served over the past 5 years is shown in Table 11.

Table 11 Number of visitors served over the past 5 years

Unit: Person

Item	Person Item	2014	2015	2016	2017	2018
Exhibition Hall	Permanent Exhibition	698,550	609,597	870,923	811,766	770,247
	Paid Special Exhibition		36,286	132,264	62,654	43,160
3D Theater		113,575	86,300	119,579	127,373	96,771
2nd and 3rd Special Exhibition Halls		157,223	284,324	316,632	481,412	82,382
Experience Activity		135,585	170,175	157,466	145,767	179,263
LOHAS Energy Conservation House		5,923	5,578	5,287	3,122	21,278
Open Storage		13,993	16,755	18,214	14,786	10,886
Popular Science Library		103,614	60,479	77,964	78,239	84,615
Leased Area		118,570	127,501	106,205	114,700	109,921
Outdoor Plaza		575,581	574,584	475,734	494,611	530,507
Total in Museum		1,922,614	1,971,579	2,280,268	2,334,430	1,929,030
External services (Taiwan)		334,720	437,754	424,639	572,126	574,375
External services (Overseas)		0	195,079	454,598	59,960	557,737
Total (Taiwan)		2,257,334	2,409,333	2,704,907	2,906,556	2,053,405
Total (incl. Service Overseas and in Taiwan)		2,257,334	2,604,412	3,159,505	2,966,516	3,061,142



2. Materializing the service culture of treating every visitor as a VIP guest by applying the concept of PDCA

NSTM is the only museum to receive the ISO 9001 Plus Award

Since introducing the ISO 9001 quality management system in 2006, NSTM has upheld the spirit of "Fortifying Our Foundation, Seeking Reasonable Improvement and Pursuing Excellence", as well as the quality policy of "Friendliness, Professionalism, and Innovation". From ISO 9001:2000, ISO 9001:2008 to the latest ISO 9001:2015, we have strived to expand the depth and scope of quality management documents based on the content of the latest edition, so as to make swift adaptations and upgrades. Through regular, standardized follow-up procedures, external assistance, audit and other measures, NSTM is able to ensure the normal functioning, timeliness and adequacy of the system. This is also implemented in service etiquette, allowing the public to appreciate NSTM's convenience and thoughtfulness. Through long-term, relentless endeavors, NSTM received SGS's ISO 9001 Plus Award (QMS Transformation and Innovation Management Benchmark) in 2018 for embodying and standardizing the concept of PDCA in the innovation and refinement of the museum's exhibits, collections, science education, and service. Various procedures are simplified, convenient, quick and digitized, where the attitude of respecting

customers is applied to increase the number of repeat customers and their loyalty.

In addition to ISO quality management, NSTM's PDCA spirit is also embodied in the form of mystery shoppers in order to shape the culture of "everyone is a guest". After passing Qualicert international service quality certification in 2017, we continued to conduct follow-ups and internal audits. In 2018, we employed a professional firm to carry out mystery shopper and telephone service etiquette tests with the ambition of improving, advancing, and optimizing our service enthusiasm on an ongoing basis!



NSTM received ISO 9001 Plus Award



3. Improvements of diverse service facilities in the lobby to create a brand-new appearance

In response to the changes in the robot demonstration, the need to develop cultural & creative merchandises, and to solve the prolonged sun exposure problem at the Information Desk, NSTM implemented a renovation of the Information Desk in the first-floor lobby, the theater on B1F, the cultural & creative area, and robot demonstration. The aim is to create functional venues that can cater to diverse needs in various areas, and technology is applied to broaden the audience's horizon, thereby elevating NSTM's service quality.

In order to increase product exposure, NSTM Store has adopted an attractive window display as its design theme, and the appealing ambiance is coupled with interactive multimedia facilities to generate the unique appeal of a museum souvenir store.

The robot demonstration is a popular show among adults and children alike, therefore a comprehensive performance space has been set aside for the robot demonstration. Live science education demonstrations are also conducted to increase interaction with the audience via diverse, dynamic performances, in turn generating more word of mouth marketing benefits for NSTM.



NSTM Shop



The spacious, multifunctional lobby space



Public Relations and Marketing

1. Utilize media resources, develop marketing channels

In accordance with NSTM's 3D marketing network concept, we have developed and maintained good relations with reporters from print, network, broadcast and television. Moreover, NSTM has maintained good interaction with educational experts over the years, thereby gradually establishing a relevant database. Also, NSTM has actively provided the latest and most relevant information on the museum's popular science promotional events, thus enabling the formation of a positive cycle in the industry, while word-of-mouth and proactive promotions have improved the marketing performance every year. NSTM issues press interview notices and news releases from time to time. In total, 52 press interview notices and news releases were issued over the year, and the NSTM Newsletter was also sent to the media regularly to establish a feedback mechanism for media exposure. In turn, this is used as the basis for selecting outstanding media for placing our advertisements.

In 2018, over 32 advertising media procurements and promotions were conducted, resulting in media exposure in China Times, United Daily News, The Commons Daily, Taiwan Times, Life Times,

Mandarin Daily News, Comment News Website, CHN, Fengmin Radio, FMHit Radio, KISSRadio, CNA, SuperFM98.5, China Daily News, Happyradio and other NSTM-friendly media, etc. In addition, 29 special exhibitions and marketing activities were held throughout the year.



Opening ceremony of Love and Care for Disadvantaged Students from Remote Villages



South Complex solar photovoltaic system activation ceremony



2. Utilize social media to update information

Due to the popularization of social media and the emergence of civil participation, NSTM established a Facebook fan page (<https://www.facebook.com/ilovenstm>). As of the end of 2018, the fan page had 75,765 members, an increase of 18% over 2017 (63,678 members). NSTM communicates information to our Internet fans via NSTM's Facebook fan page, which includes permanent exhibitions, special exhibitions, science education events, selected collections, seminars, relevant images and writings, videos, as well as science, environmental education, and science education news. We wish to bring forth applied science and the vision of a green museum in both an educational and entertaining manner. NSTM also makes use of videos, images, and articles published on the official website (<https://www.nstm.gov.tw/>) and YouTube (<https://goo.gl/QaMQ9Z>) to increase event information awareness and reinforce customer satisfaction. In 2018, the total number of visitors reached by Internet information amounts to 11,795,550. Number of visitors served with Internet information as shown in Figure 8.



NSTM YouTube channel website

<https://www.youtube.com/channel/UC2fBSQsb8s-d5LU0gqYDoyQ/featured>

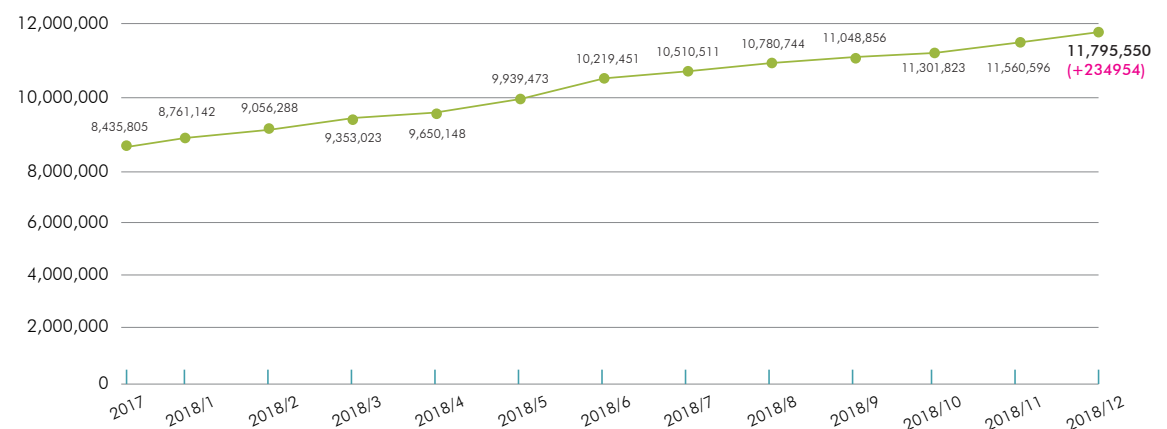


Figure 8 Total number of visitors reached by Internet information



4. Activate the power of knowledge - Smart new technology

With the advent of IoT, NSTM has developed diverse exhibits incorporating fields such as smart manufacturing, smart transportation, disaster prevention technology, wearable technology, and high-tech farming. A rich interactive learning experience is created in premium national exhibition venues to inspire students' creativity and imagination in conjunction with the national 12-year education policy, as well as to foster environmental education in Taiwan. In order to improve emerging technology awareness among senior high school and vocational high school (or lower level) students, and enable elementary school/junior high school teachers and students to experience and learn emerging technology, NSTM teamed up with K-12 Education Administration, MOE, to devise related activities such as the Activate the Power of Knowledge - Smart New Technology science and technology museum visit and obstacle game; introducing emerging technology development-related firms; maker organizations' Technology is Fun - Smart Technology Carnival; and participated in The Taoyuan Arena's Activate the City with Smart Technology - TIRT Taiwan International Robotics Tournament and Makers' Carnival. NSTM's new technology demonstrations are promoted at major international functions, and emerging technology DIY courses are

also conducted (in-depth learning class) in order to materialize K-12 Education Administration's educational philosophy of Reinforcing Fundamental.



Technology is Fun - Smart Technology Carnival



Guided Tour

1. Provide quality tours to enrich the tour experience

In correspondence with our exhibitions, we provide the public with a diversity of guided tour services, which include: group guided tours, active guided tours, robot demonstrations, and "periodic guided tours" specific to each different special exhibition and exhibition hall. Guidance and narration services were rendered to 4 exhibitions and special exhibitions in 2018, including Brain-The Biology of Mind, Explore IoT, Telecom@Taiwan, and Adventures in Health Land. A total of 1,345 narrations were provided for these exhibitions and 4,146 different guidance services were rendered for 124,823 visitors.

2. Renewing robot demonstration offers the audience with a novel experience

NSTM's robot demonstration aims to transform robots into the showpiece of the museum in an effort to increase its reputation and number of visitors. Through the robot's interaction with the audience, they will feel respected and motivated to visit NSTM again. The robot is capable of chatting, singing and dancing, as well as educating the audience about the concept and knowledge of environmental protection. Furthermore, it can also provide an introduction to the museum's environment, introduce matters

requiring attention and conduct a guided tour of exhibition halls. Technology and Science I were commissioned in 1998. They were replaced by Technology and Science II in 2005, and subsequently by NAO in 2016. Robots are evolving from life-size products into miniature, companion-oriented functional robots. Due to a variety of reasons, such as outdated technology and difficulty in maintenance, the abovementioned robots were progressively decommissioned in 2018. In particular, Science and Technology I and II have entered the Archives Room for safekeeping, while the decision for NAO is still pending. The new interactive robot purchased in 2018 can interact with the audience via a joystick, sound or motion sensing. Combined with the handmade soccer field, the robot has proven to be extremely popular among the public. Furthermore, with ASUS launching the ZENBO Junior robot in August 2018, the robot demonstration area in the lobby will also be renovated to present the public with a brand-new appearance. In total, 613 demonstrations were held for 28,457 visitors in 2018.



NAO robot's performance attracting a large crowd



Economic disadvantaged groups attend a field trip to NSTM courtesy of the NSTM Lanterns of Love Program

Resources Utilization

1. NSTM Lanterns of Love

In order to bridge the divide between the rich and the poor, and implement scientific education, NSTM promoted the "2017 NSTM Lanterns of Love" Program welfare program for the disadvantaged, accepting donations from philanthropists at NT\$10,000 per lantern to financially support the economically disadvantaged students in visiting the museum. By encouraging the utilization of social

education resources to improve school education, the program also facilitates NSTM's goal in integrating social resources and school education. In addition, the program offers economically disadvantaged school children with field trips, improves studying conditions and ensures the development of science education by organizing the "2018 NSTM

Lanterns of Love Program Tour", thereby continuing to promote the philosophy of helping disadvantaged school children to learn in the museum.

The program generated a total donation of NT\$3,091,440 (including NT\$300,000 from MOE), served 222 schools, and arranged for 5,530 teachers and students to visit the museum free of charge. The museum education like this gives an opportunity to root science and gratitude among the students from remote villages. It helps spread the power of love from society and gives a chance for the children to bring their role into full play in the future.



2. Adequately utilize social resources to aid disadvantaged groups

To help students from remote villages share the resources of the museum, Chunghwa Telecom, the Taiwan Telecommunication Industry Development Association, and NSTM jointly initiated a program of "Love and Care for Disadvantaged Students from Remote Villages" to help them have a day of vitality and knowledge and make their dreams come true by fully subsidizing their visit to the museum. Two visits were provided in 2018, where 501 teachers and students from 7 schools participated in the event.



Love and Care for Disadvantaged Students from Remote Villages Event



3. Utilize social manpower resources to improve overall performance

NSTM is the first applied science museum in Taiwan and the center of science education promotion in South Taiwan. Facing limited manpower, we ask for social human resources for provision of service according to the Volunteer Service Act. The scope of service includes reader services, collection maintenance, collection management, maintenance services, educational activities, exhibition services, Chunghwa Telecom exhibition services, theater services, audience services, volunteer administration, guided tours, nursing, information desk, promotion, group cafeteria, energy-saving house projects, general affairs, and gardening. A total of 1,159 volunteers with an accumulated 199,863 service hours rendered

services for the museum by the end of 2018. Three discussion meetings of 180 volunteer team leaders and one Volunteer Commendation Ceremony and Dinner Party with 999 participants were held.

NSTM helped to establish the "NSTM Volunteer Foundation" in 2012. The source of the fund primarily comes from volunteer donations, and flea market charity events held at our gift shop halls on the first Sunday afternoon of each month. The funds were used for volunteer gift money, consolations, volunteer travel, as well as charity donations in accordance with the annual balance. The fund balance for 2018 was NT\$ 470,232.



Volunteer commendation ceremony



Annual volunteer trip



4. Provide service opportunities to encourage students to engage in volunteer services

In supporting the implementation of the national 12-year education policy, since 2012, the scores of service learning (volunteer service) in diverse learning performance has been considered an important factor. In encouraging students to commit to volunteer services and providing service opportunities, NSTM amended the "Rules of Student Social Services of the National Science and Technology Museum", which was implemented in June 2012. NSTM conducts educational training once per month. All students enrolled in junior high schools or above are eligible to apply. In 2018, 900 students participated in social services with a total service time of 4,434 hours.

5. Conduct community events to forge good community relations

Since the Building Good Community Relationship Plan was approved in an NSTM meeting in November 1997, we have held related activities every year. The activities combine social resources to cater to the needs of the community and maintain good public relationships with local residents. The plan also engages in community development by incorporating community residents as an integral part of NSTM's support resources, in turn generating

excellent interaction with local communities and enhancing NSTM's favorable image. Table 12 provides a summary of the number of participants in community events from 2014 to 2018.



Visitors attending the community event



Three different types of activities were held in 2018:

- (1). Movies for the residents of the neighborhood during the first half of 2018: For the 6-day event from February 6 (Tuesday) to 11 (Sunday), a total of 1,709 residents visited NSTM for the movie.
- (2). Organized Color Gallery exhibition and Wow! Somatosensory Adventure 2.0 exhibition or coffee sachet combo experience activities (choose one from two). A total of 1,337 people took part in the activity on August 11, achieving a record high over the recent years. In particular, 1,000 tickets were handed out for Wow! Somatosensory Adventure 2.0 exhibition along with 337 for coffee sachet combo.
- (3). Movies for the residents of the neighborhood during the second half of 2018: For the 6-day event from August 7 (Tuesday) to 12 (Sunday), a total of 2,271 residents visited NSTM for the movie.

Refer to Table 12 for the number of participants in community events over the past years.

Table 12 Summary of the number of participants in community events over the past years

Events \ Annual	2014	2015	2016	2017	2018
Movie appreciation during the first half of 2018	691,023	1,508	1,210	3,125	1,709
Movie appreciation during the second half of 2018	1,149	2,341	2,326	1,884	2,271
Special exhibition visit	631	884	1320	990	1,337
Total	2,803	4,733	4,856	5,999	5,317



6. Join International Museum Organization to expand international exchanges

NSTM is a member of the Asia-Pacific Network of Science and Technology Centres (ASPAC), which consists of primarily science centers or museums in the Asia-Pacific region (including New Southbound Policy countries), making it the pivotal science museum organization in the region.

By attending ASPAC's annual conference and various exchange activities, NSTM is able to establish direct communication channels with various science centers through face to face meetings. As

a result, NSTM can export our exhibitions, science education activities, and cultural & creative products and engage in a wide range of international exchanges, thereby keeping abreast of the latest developments and trends in the international museum scene, and use them as reference for NSTM's future operations and management. NSTM attended the 2018 ASPAC annual conference held at the National Taiwan Science Education Center, where our colleagues presented papers to promote the existing and future collaborative projects between NSTM and ASPAC members in order to highlight our accomplishments in international cooperation.



Through the theme food trolleys in the Cultural Diversity Area, rice cultures in different countries are exhibited, including Taiwan, Thailand, Singapore, Philippines, Malaysia, Japan, Korea, India, Australia, and Indonesia.



NSTM, National Science Museum Thailand and Singapore Science Centre co-organized the Rice is Life Exhibition.



7. Invited to attend the Turkish Airline Science Expo

The Bursa Science and Technology Centre in Turkey invited NSTM to attend the Turkish Airline Science Expo. On the one hand, this provides an opportunity to observe Turkey's capability in promoting popular science education and ways to inspire children's creativity learning, while on the other hand, we can also observe the country's approach in hosting major science expos. In addition to obtaining more information pertaining to Islamic nations, the aim is to market NSTM's achievements in science education. NSTM participated in the event in Turkey to accomplish 3 missions: To unveil more than 2 science education activities using exhibit prop "Bamboo Chopstick Rubber Band Gun Shoot Levitating Ball" and the principle of resonance bowl. Moreover, NSTM was invited as part of the overseas team to stage science demonstrations and sign an MOU with Bursa Science and Technology Centre, hoping to facilitate future collaborations in science education and itinerant exhibitions. NSTM colleagues also paid a visit to Istanbul Museum of The History of Science & Technology in Islam in an effort to gain deeper insight into the development history of Islamic science and technology.



NSTM colleagues attending the Turkish Airline Science Expo



NSTM's booth at Turkish Airline Science Expo

Green Museum





In 2018, NSTM continued to strive toward the ideal and vision of being a green museum by upholding our sustainable development philosophy in order to carry out the function of educating the public about technology education. From the 4 major aspects of "Sustainable Environment", "Sustainable Society", "Sustainable Culture", and "Sustainable Economy", we aim to promote sustainable development strategies including environmental protection, fulfilling our CSR, enhancing cultural heritage and sound finance. NSTM's implementation status and results in the current year are as follows:

Sustainable Environment Aspect

The aim of Sustainable Environment is to make NSTM a friendly, comfortable, and enjoyable environment for visitors. The items of implementation include 4 topics: "energy-saving & carbon reduction", "green building improvement", "green consumption", and "museum outdoor learning".

Important achievements include co-organizing the Sustainable Environment - Water Conservation Expert activity with the Water Resources Agency, MOEA, and the Environmental Protection Bureau, Kaohsiung City Government, as well as co-organizing the

Environmental Education Cross-Industry Integrated Academic and Practical Forum with EPA, Executive Yuan, and the Environmental Protection Bureau, Kaohsiung City Government. Annual renewable energy generated 90,000 kWh, annual green procurement reached 100% and created 1,400 tree QR Code descriptions.



Provide the public with a friendly, comfortable, and enjoyable museum environment



"Hand-in-Hand, Side-by-Side" welfare project for the disadvantaged

Sustainable Society Aspect

The aim of Sustainable Society is to fulfill our social responsibilities, pursue social justice, and develop diverse participation in order to receive recognition and support from the public, communities, and other domestic/foreign museum communities. The 3 sub-programs include: Developing a Diverse Audience Program; Promoting Community Collaboration Program; Environmental Education Enhancement Program.

The major achievements include: Accumulating 72,480 fans on social media, showing a 13% growth compared to last year. "Hand-in-Hand, Side-by-Side" welfare project for the disadvantaged received funding of NT\$3,091,440, sponsoring 5,530 teachers and students from 222 schools to visit NSTM free of charge. Four environmental education enhancement courses were held, accumulating 4 hours of training and education for 194 visitors. Organized Environmental Education Cross-Industry Integrated Environmental Education Research Practice Interdisciplinary Forum, publishing 16 environmental education-related dissertations. The forum was attended by 150 people.



Sustainable Culture Aspect

The aim of Sustainable Culture is to improve the transmission and innovation of culture via our collections research, exhibitions, and educational events. The program includes the 3 topics of "Cultural Asset Preservation", "Green Education", and "Green Exhibition". The 3 sub-programs include the collection and research improvement project, green education promotion project, and the green exhibition and assessment project.

The major achievements include: Digitization of 492 collected pieces; organized the 2018 Museum Preservation and Restoration Workshop; conducted 30 artifact analyses; organized 2 artifact promotion and experience activities at schools in remote townships; developed 5 creative pieces of merchandise for the museum. In terms of green education promotion, NSTM held 25 specialized personnel training sessions, and over 182 water-saving, electricity-saving, solar photovoltaic, new energy technology, environment, ocean, ecology, and disaster prevention sessions, with 75,142 participants.

Cultural activity achievements include 2 exhibitions, such as the Passing Tapes of Memories Down the Generations - Audio Record Collection Exhibitions. In addition, NSTM continued to implement

science education and promotion activities for the disadvantaged community. In total, 45 education and promotion activities were conducted for 2,543 participants, including Cultural Diversity, Mobile Science Experiment Station, Remote Township Fun City, and Solar Energy Journey.

Green exhibitions include NSTM launched Climate Change Exhibition Hall, Recovery and Reconstruction After Morakot Exhibition Hall, and Soil and Water Conservation area, Story of Taiwan's Agriculture - Plant Workshop, Science and Technology for Disaster Reduction, Passage of Wind - Wind power exhibition and outdoor solar power exhibition. The aim is to transform NSTM into a quality educational facility for environmental education, and we achieved a total visitor number of approximately 1.01 million people. In addition, NSTM completed 4 green exhibition assessments, with 4 exhibition halls attaining "Gold" status.



Allowing metrology education to take root in remote townships



Sustainable Economy Aspect

The aim of Sustainable Economy is to conduct cost control, reduce operational costs, and establish a sound financial mechanism. The items of implementation included the topics of "Resource Recycling" and "External Resource Utilization". The sub-program was to increase revenue and decrease expenditures.

The major achievements in this regard: revenue for 2018 was NT\$206,306,631, expenditure reduced in 2018 was NT\$52,717,054, resulting in a total of NT\$259,023,685.

NSTM also launched the membership program, accumulated 10,795 iPass transactions. Moreover, we have recruited 36 corporate members including Han-Hsien International Hotel, Urban Hotel 33, McDonald's Taiwan, Formosa Plastic Group – Kaohsiung Office, Mandarin Daily News, etc.



Increasing external resources and utilization via including business member

General Affairs and Environment





General Affairs Management

1. Public Procurement to Conserve Public Funds

As for the outsourcing and contract awarding cases to the amount of more than NT\$100,000 in 2018, there were 86 projects with an accumulated budget for invitation to tender of NT\$156,538,923, the accumulated contract awarding amount was NT\$148,898,520, and a total of NT\$7,640,403 was saved, equivalent to 4.88%. There were 543 procurement cases to the amount of more than NT\$10,000 and less than NT\$100,000. The requested amount was accumulatively NT\$22,972,261, and the settled amount was NT\$22,533,097, indicating a total saving of NT\$440,164, equivalent to a 1.92% saving.

2. Interest Income Resource Widening

In order to increase interest income and utilize fixed deposit more flexibly, in addition to the existing 401 NSTM account of operational fund in fixed deposit in the Agent Institutions of National Treasury (Taiwan Business Bank, Eastern Kaohsiung Branch), NSTM also has fixed deposits at Chunghwa Post. Currently, the total amount of fixed deposits, including deposits in the Taiwan Business Bank and Chunghwa Post is NT\$143 million. The interest generated in 2018 was NT\$1,874,557. In 2018, NT\$1.35 million rent income was

generated from base stations established by 5 telecom companies. Furthermore, NT\$121,000 was generated by auctioning scrapped products to actively increase income by widening resources.

3. Emphasis on the performance of internal control

NSTM continued internal control in 2018 and signed the 2018 Internal Control Effectiveness Statement and announced it on our website. Other achievements include the amendment of the Regulations on Setup of Internal Control Task Forces, the establishment of the 2018 self-evaluation and internal audit plans, execution of self-evaluation and audit, and proposition of 9 deficiencies and reform suggestions. NSTM also upgraded our internal control system to version 8.0 according to the "Regulations on the Internal Control and Monitoring in the Government" amended by Letter Yuan-Shou-Zhu-Zong-Gui-Zi No. 1050600776A and the "Sample Making Principles for the Commonality of the Internal Control (Incl. Cross-Functional Integration) in the Government" established by Letter Yuan-Shou-Zhu-Zong-Gui-Zi No. 1050600786, December 30, 2016, of the Executive Yuan.



Signed 2018 Internal Control Effectiveness Statement and announced it on Website

4. Improve archives Management Quality

Secretariat received 15th Records Management Quality Awards in 2017. In 2018, NSTM continued to show outstanding achievements. Associate Technical Specialist Chia-hsing Yeh was the recipient of the 16th Outstanding Archivist Award for Government Agencies, which saw participation from 111 archivists throughout the country. After the rigorous reviewing process, NSTM's management service has once again received a seal of approval for professional quality.

NSTM also organized MOE's 2018 Affiliated School Documents and Archives Supervisor Education and Training, where 69 archives supervisors attended the 2-day lecture and the archives application

exhibition, as well as cultural & creative merchandise and archives restoration exhibition etc. The program was well received by the archives supervisors, serving as a testament to NSTM's archives management performance. All 22 items stipulated in the annual work program were completed on schedule.



16th Outstanding Archivist Award for Government Agencies award ceremony



Electromechanical Operations

1. Saving energy to fulfill the Green Museum concept

Compared to 2017, various energy-saving achievements in 2018 were: saving 10.43% of electricity (1,327,767 kWh), and 11.12% of water (7591 m³). The power and water consumption statistics analysis over the last 10 years are shown in figure 9 and 10.”

Thanks to the installation of smart water meters in 2016, coupled with the repair of the leaking water mains at the South Complex, the water conservation benefit should have been noticed in 2017; however, due to the renovation of the garden outside the Popular Science Cafe Library, a large quantity of water was used to sprinkle the construction site, therefore NSTM only achieved

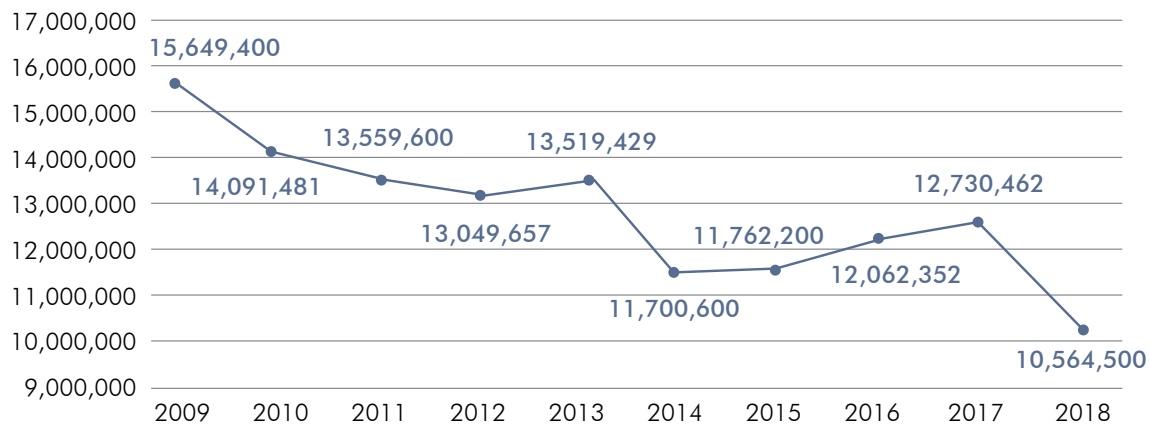


Figure 9 Power consumption over the last 10 years



a 5.8% water saving for the year. Since the Popular Science Cafe Library was completed in October 2017, there is no more need for water sprinkling, therefore the water conservation benefit of the water mains leakage repairing project at the South Complex was demonstrated this year, achieving a water saving of 11.12% in 2018. Improvements made to electrical equipment are: (1) Two 50RT chillers at the North Building were replaced; (2) Exhaust fans were

installed at substations in area A and D; (3) Air conditioning duct modification in area E; (4) Replacement of energy-saving lights. Total electricity saved: 1,327,767 kWh.

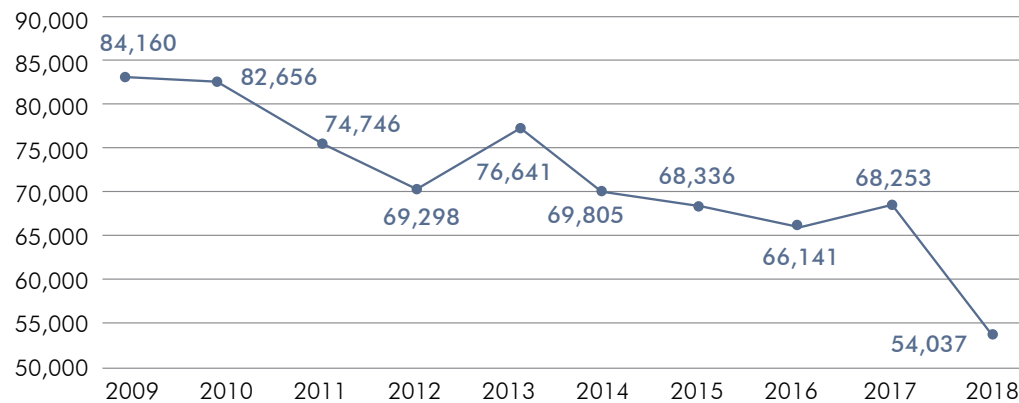


Figure 10 Water consumption over the last 10 years



2. Introduction of ISO 50001 Energy Management System

Through teamwork and regular review by the cross-divisional and office energy team, they revised documents and forms, inspected the meters, reviewed the energy baseline and regression formula used for estimating power consumption, proposed action plans for saving energy (such as power saving during annual maintenance, changing the AC units etc.). In addition, key data has been collected, while power consumption audit and internal audit (September) were conducted along with energy audit (September) and external audit (October), as well as document review (conducted when the expiry date is reached), and on-site audit.

In 2018, NSTM commissioned SGS to implement the museum's ISO50001:2011 energy management system accreditation on October 11 (second round). NSTM was also registered with the Taiwan Accreditation Foundation (TAF) and received a certificate on October 27, valid until October 20, 2021.

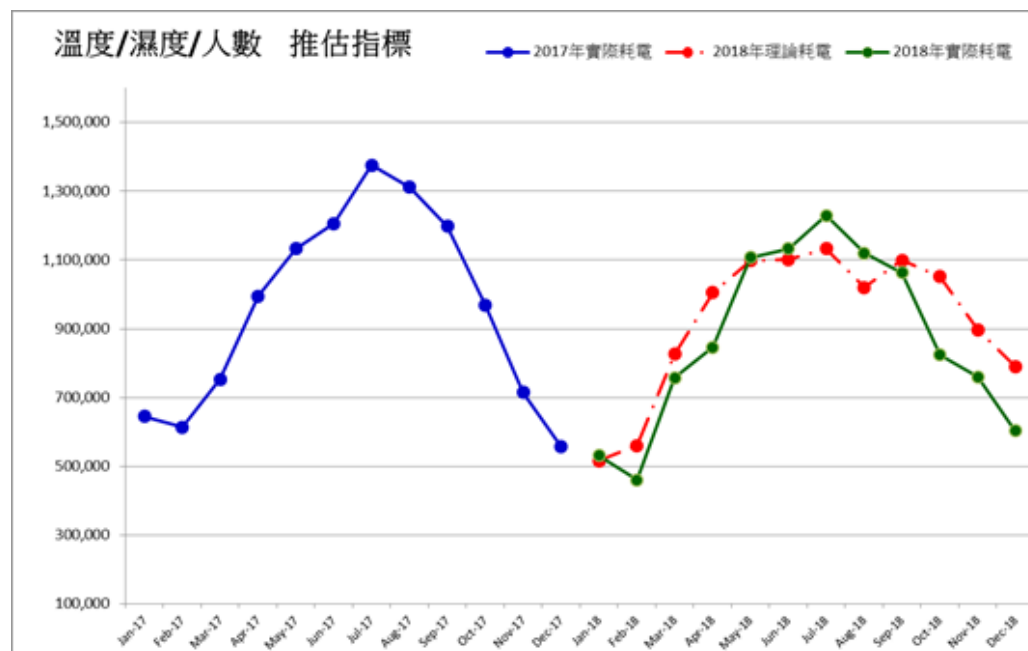


Figure 11 2018 energy baseline and regression formula



3. Occupational disaster prevention preparedness

NSTM conducted the NSTM Occupational Safety and Health Meeting for the First Half of 2018 on July 16 (Monday). During the meeting, occupational safety and health-related problems encountered during the first half of 2018 were discussed, and audits were also arranged for the items specified in the annual Occupational Safety and Health Self-inspection List of various divisions and offices. The Occupational Safety and Health Meeting for the Second Half of 2018 is scheduled to be convened on December 25.

Items completed so far this year:

(1) The emergency exit leading from the biology laboratory to the Adventures in the Health Land was sealed, which is a potential safety hazard, therefore after coordinating with various divisions and offices, the lock on the emergency exit was removed, and an Emergency Exit light was installed above the emergency exit to enhance the safety of the museum's workplace.

(2) The Personnel office was asked to incorporate the Annual Employee Health Examination (new employees and regular employees) into the 2018 NSTM Occupational Safety and Health Self-inspection List. As for new employee occupational safety and health education and training, regular employee occupational safety and health education and training, and new volunteer occupational safety and health education and training, the Visitor Services Division has incorporated them into the volunteer internship and special training program.



4. Reinforce Maintenance to Uphold Public Safety

- (1) Investigation of water seepage at the hallway outside the Green Living Exploratorium and water drainage improvement plan:

On rainy days, water seeps down the column of the hallway, causing water to accumulate on the ground and trickle to the interior. After 3 months of investigation and probing using an electronic instrument, it was decided to replace water drainage pipes inside the column with larger external pipes to accommodate increased water flow and prevent water intrusion.

- (2) Color painting of the hallway walls outside the Green Living Exploratorium:

In order to improve the aesthetics of the museum, color painting of the hallway walls outside the Green Living Exploratorium was implemented. The adorable theme of Azure Dragon was used. The Azure Dragon symbolizes one of the Four Symbols in traditional Chinese culture, representing Azure Dragon of the East and categorized as Wood in the Five Elements. Its red apparel symbolizes prosperity; complemented by the 4 Dragons of Auspiciousness of Armillary Sphere, they are collectively known as Five Blessings.

- (3) Design and subcontracting of the family restroom:

The Protection of Children and Youths Welfare and Rights Act stipulates that one independent family restroom must be constructed for every 3rd floor, therefore the fourth floor toilet on the west side of the North Building and the outdoor toilet on Jiuru Road, South Complex, were renovated (completed at the end of December). Toilets on the east side of the first floor of the North Building and by the lecture hall on the first floor of the South Complex are expected to be renovated in 2019.



(4) Outdoor gardening and maintenance of surrounding facilities

Continued outdoor gardening and maintenance of surrounding facilities, including regular gardening, trimming, posting of tree QR_CODE descriptions, Keep Your Dog on a Leash and Pick Up After Your Dog signs, as well as tidied up tree roots that have affected the structure of the gutter and caused uneven ground surface, improved drainage and constructed catch drains. Furthermore, barricades were installed along the sidewalk, canopies were improved, outdoor chairs were installed along with outdoor water tanks, and plumbing of the sprinkler system was improved.



Improve canopies

(5) Sought for external collaboration and resources:

ITRI agreed to update the second floor of LOHAS Energy Conservation House by adding renewable energy exhibits, as well as restoring the wooden floor and water leakage from the August 23 flooding. MVictory agreed to donate an Outdoor Solar Multipurpose Wireless Charging Station and provide maintenance until 2020. This not only increases external resources but also enhances long-term partnership.



Outdoor Solar Multipurpose Wireless Charging Station donation ceremony



Cross-Field Value-Adding Project

In order to innovate and re-create social education institutions in terms of management philosophy and form, in turn transforming national museums in Taiwan into a contributing force during the "social innovation" process, the MOE proposed the "Cross-Field Experience, Learning for Life: Project for Cross-Field Value-Adding in National Social Education Institutes Development", which will be implemented from 2014 to 2017.

NSTM's "Southern Taiwan Technology Education Green Expo Park Project" is also proposed based on goals including environment, culture, economy and sustainable social development. The 3 subprojects of "Happy Green Park", "Happy Taiwan Industry" and "Telecom & Innovative Digital Value (Incl. Bridging to New Generation)" were set up and opened to the public in 2017.

In regards to the development of accessways in supporting the Kaohsiung underground railway system and the integration and the beautification of the South Complex, due to the delayed construction schedule of the underground railway and changes made to the integrated design, the original plan no longer catered to the need of the current circumstances, therefore adjustments

made to the budget and date extension were approved by MOE. The project is slated for completion in 2019.



Green Living Exploratorium x Family Book City



Hydrogen Power & Fuel Cell theme exploration area within Green Living Exploratorium



IT Operations

1. HTTPS encryption mechanism was implemented for the official website and tested in accordance with the Governmental Website Operation Testing Plan and Performance Indicators. NSTM's Chinese official website received full marks.

According to the letter issued by MOE Tai Jiao Chu (5) Zi No. 1060183079 to the National Development Council, all government agencies (institutions) are requested to complete the implementation of HTTPS encryption coding for their websites before the end of December 2017. After NSTM's official website

(<https://www.nstm.gov.tw>) was revised on August 31, 2017, HTTPS encryption was introduced, and the website was transferred automatically from the HTTP address to the HTTPS address.

In 2018, NSTM's Chinese website was tested with Governmental Website Operation Testing Plan and Performance Indicators and received full marks. Summary of previous testing results:

Testing date	2018/3/1	2018/3/28	2018/3/30	2018/4/7
Testing score for the Chinese version	74points	86points	90points	100points



NSTM official website homepage



2. Developed Fun City Exhibition Hall Booking System

An online booking mechanism was implemented for the most popular exhibition hall in NSTM this year - Fun City. The Fun City Exhibition Hall Online Booking System (<http://outserv.nstm.gov.tw/funcity/>) was developed in-house and opens to the public at 09:00 every morning.

2018年11月						
星期日	星期一	星期二	星期三	星期四	星期五	星期六
28	29 休館日	30	31	1	2	3
4	5 休館日	6	7	8	9	10
11	12 休館日	13	14	15	16	17
18	19 休館日	20	21	22	23 第1場 (09:10-10:00) 剩餘預約名額: 0 第2場 (10:15-11:05) 剩餘預約名額: 0 第3場 (11:20-12:10) 剩餘預約名額: 0 第4場 (12:30-14:20) 剩餘預約名額: 0 第5場 (14:35-15:25) 剩餘預約名額: 0 第6場 (15:40-16:30) 剩餘預約名額: 0	24 第1場 (09:10-10:00) 剩餘預約名額: 0 第2場 (10:15-11:05) 剩餘預約名額: 0 第3場 (11:20-12:10) 剩餘預約名額: 0 第4場 (12:30-14:20) 剩餘預約名額: 0 第5場 (14:35-15:25) 剩餘預約名額: 0 第6場 (15:40-16:30) 剩餘預約名額: 0

Fun City Exhibition Hall Online Booking System developed by NSTM

3. Constructing Green Datacenter to Effectively Save Power

In 2018, NSTM utilized budget from the MOE's medium-range plan Green Datacenter Construction Project to carry out power redistribution in the data center in the North Building. Furthermore, hot/cold aisles were created, and the datacenter space was rearranged together with the rebuilding of the distribution board. Moreover, a self-contained rack AC unit was installed, the performances achieved are:

Item	Description
Reduced datacenter square footage	New racks were purchased, and hot/cold aisles were created. Smaller space of the data center meant that smaller AC units could be used to achieve the same cooling performance. The data center in the North Complex has been downsized, and compartmentalization was applied to reduce the power of the AC unit needed.
Replacing AC units	AC is the primary source of power consumption in the data center, thus old and inefficient AC units were replaced with smaller AC units thanks to the decreased data center space.



4. Implementing the ISMS (Information Safety Management System) and passing the ISO 27001:2013 re-examination

The MOE upgraded the information safety level of its subordinate agencies (institutions) to Level B in 2015 according to the "Information & Communications Safety Responsibility Grading Regulations for MOE, its Subordinated Agencies (Institutions), and Schools". NSTM has dealt with all the matters to be completed by a Level B unit according to the "Information & Communications Safety Responsibility Grading Regulations for Governmental Agencies (Institutions)". In addition, we introduced the ISMS in 2 core information systems before 2017. By the end of 2018, 2 core information systems must pass accreditation. Both were completed in 2016 ahead of schedule. Upon receiving approval from the CISO, NSTM officially launched the Information Security Management System (ISMS) on March 31, 2016. The ticketing system, official document integration system and online service were included in the accreditation. SGS Certification and Business Enhancement Division was commissioned to conduct document review and external audit at NSTM, and the museum successfully obtained ISO 27001:2013 international accreditation. This year, NSTM continued to comply with ISMS and successfully passed the re-examination in June 2018 to maintain the validity of the certificate.

5. Completed certification upgrade of BS10012:2017 personal information management system

In an effort to ensure NSTM's PIMS complies with international standards, in 2018 we continued to incorporate the "Personal Information Management Related to Registration of the Continuing Education Organized by the Technology Education Division and the Membership Card Application to the Visitor Services Division" in the scope of the certification, and the 2009 version was upgraded to 2017. The audit result showed no shortcomings, and the upgrade was completed.

6. Completed official document management system's integrated incoming and outgoing module

In response to the termination of service by the National Archives Administration, National Development Council's electronic official document exchange system on January 1, 2019, the electronic document incoming and outgoing module was integrated to NSTM's existing official document management system in December 2018 in order to maintain the normal functioning of incoming and outgoing official documents.



7. NSTM was selected as an outstanding organization for MOE's Open Government Data Operations Evaluation

In 2018, NSTM conducted data set quality evaluation based on the National Development Council's Open Government Data Platform, focusing on 5 aspects of quality testing (connection status, direct download, structured format, coding compliance, main column description compliance) to conduct system automatic testing. NSTM has 35 open datasets, including 34 gold labels and 1 silver label.

8. NSTM APP passed the Industrial Development Bureau's Mobile Application Basic Security Inspection Standard and received a medium rating.

In order to ensure the public's information security on their mobile devices when downloading and using the NSTM App, as well as to minimize information security risk, NSTM commissioned iForensics Digital Inc. in 2018 to test the app, which successfully obtained a medium information security rating in June, thereby significantly improving the app's security.

App檢測通過名錄-詳細內容			
送檢單位名稱	國立科學工藝博物館	權表編號	MAS-3016-10700042
App名稱	掌園科工	權表版本	1.3.15(iOS)
作業系統	iOS	其他(請註明):	
安全等級	第二級	檢測標準版本	v2.1
檢測級別	中級	App申請檢測日期	
發證日期	2018/06/08	證書效期截止日	2019/06/08
檢測機構名稱	臺灣數位鑑證實驗室	檢測日期	2018/05/21
檢測實驗室名稱	臺灣數位鑑證實驗室	實驗室認證狀態	TAF認證實驗室
App類別	教育類	其他(請註明):	
發佈狀態	已發佈	行動應用程式商店網址	https://itunes.apple.com/tw/app/掌園科工/id1156379513?mt=8

NSTM APP passed the Industrial Development Bureau's Mobile Application Basic Security Inspection Standard and received a medium rating.

Budget Execution





Annual Balance

The total revenue from execution results of NSTM in 2018 was NT\$392,815,000. The main source was the social education institution development grant of NT\$200,244,000, which occupied 50.98% of the total revenue. Self-raised funds was NT\$192,571,000, occupying 49.02% of the total revenue. Out of which, cooperative Education Income of NT\$57,104,000 took the top, occupying 14.54% of the total revenue. The second highest was the income from service Income of NT\$41,284,000, occupying 10.51% of the total revenue. The rest in order were: Other Subsidy Income of NT\$38,344,000, occupying 9.76% of the total revenue; asset-use and royalties Income of NT\$31,720,000, occupying 8.08% of the total revenue; educational Promotion Income of NT\$15,720,000 occupying 4.00% of the total revenue; other income of NT\$5,359,000, occupying 1.36% of the total revenue; donation income of NT\$3,040,000, occupying 0.77% of the total revenue.

Business costs and expenses of NT\$470,650,000, occupy 119.81% of the total revenue; other business expenses of NT\$1,882,000 occupy 0.48% of the total revenue. Our annual shortage amount was NT\$79,717,000, this was attributed to the fact that operational funds must be depreciated and amortized. On the income side, the self-raised ratio of NSTM in 2018 was 49.02%.

Table 13 2018 Income statement

Unit: Thousand NT\$

Item	2018 Yearly budget Amount	2018 accounts Amount	2017 accounts Amount
Business Income	296,238	352,696	359,281
Service Income	45,775	41,284	51,510
Exhibition Halls	18,005	20,667	20,702
Special Exhibitions	14,705	9,194	17,976
Theater	8,690	6,052	8,745
Experience Facilities	4,375	5,371	4,082
Popular Science Card	0	0	5
Cooperative Education Income	27,221	57,104	59,651
Educational Promotion Income	9,723	15,720	13,059
Social Education Institution Development Grant (A)	200,244	200,244	196,446
Other Subsidy Income	13,275	38,344	38,615
Other Business Income	32,516	40,119	37,632
Interest Income	1,600	1,968	1,869
Gains on Exchange	0	23	17
Asset-use and Royalties Income	29,906	31,720	28,169
Donation Income	0	3,040	3,005
Breach and Fine Income (including reparations)	50	416	2,806
Miscellaneous Income	960	2,952	1,766
Total Income (B)	328,754	392,815	396,913
Business Costs and Expenses	426,320	470,650	453,010
Service Costs	247,257	261,342	265,463
Cooperative Education Costs	19,830	52,551	29,447
Educational Promotion Costs	6,733	8,966	10,235
Management Costs and General Expenses	152,500	147,791	147,865
Other Business Expenses	240	1,882	1,234
Losses on Exchange	0	203	0
Miscellaneous Expenses	240	1,679	1,234
Total Expenses	426,560	472,532	454,244
Yearly Surplus (Shortage-)	-97,806	-79,717	-57,331
Government Current Grants Ratio(A)/(B)	60.91%	50.98%	49.49%
Agency Current Self-Raised Ratio 1-(A)/(B)	39.09%	49.02%	50.51%
Self-Raised Income	128,510	192,571	200,467

Source: Annual Budgets, Financial Accounts



Annual Capital Expenditure

The total amount of annual capital expenditure budget in the fixed asset was NT\$62,325,000, which included NT\$28,655,000 from government support, NT\$33,670,000 from self-raised funds.

Table 14 2018 Fixed Asset Facility Improvement
/ Expansion Balance Sheet

Unit: Thousand NT\$

Projects	Available Budgets	Yearly Accounts
Fixed Asset Additions		
Government Support	30,432	28,655
Self-Raised Funds	32,082	33,670
Total	62,514	62,325

Past Revenues, Expenditures, Budgets and Final Accounts

Table 15 Past Revenues, Budgets and Final Accounts

Unit: Thousand NT\$

Item Year	Budgets					Financial Accounts				
	Total	Social Education Total Institution Development Grant	%	Self-Raised	%	Total	Social Education Total Institution Development Grant	%	Self-Raised	%
2014	280,823	196,446	69.95	84,377	30.05	312,904	196,446	62.78	116,458	37.22
2015	283,867	196,446	69.20	87,421	30.80	328,514	196,446	59.80	132,068	40.20
2016	278,857	196,446	70.45	82,411	29.55	375,744	196,446	52.28	179,298	47.72
2017	302,100	196,446	65.03	105,654	34.97	396,913	196,446	49.49	200,467	50.51
2018	328,754	200,244	60.91	128,510	39.09	392,815	200,244	50.98	192,571	49.02

Source: Annual Budgets, Financial Accounts



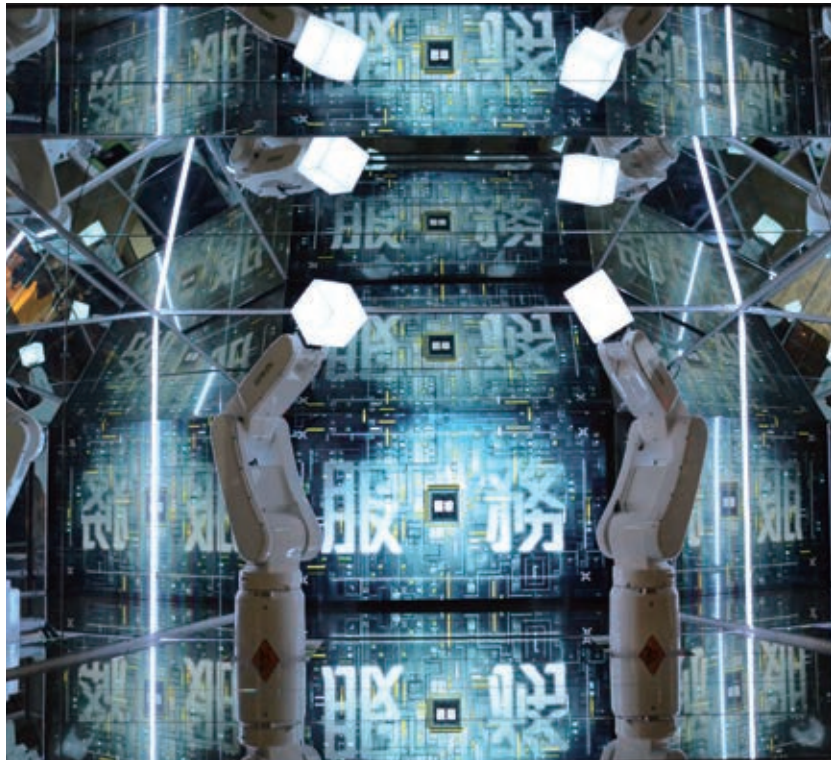
Table 16 Past Expenditures, Budgets and Final Accounts

Unit: Thousand NT\$

Item Year	Budgets					Financial Accounts					
	Total	Recurrent Expenditures	%	Capital Expenditures	%	Total	Recurrent Expenditures Staff Costs	Recurrent Costs	%	Capital Expenditures	%
2014	435,237	382,168	87.81	53,069	12.19	423,384	125,236	245,857	87.65	52,291	12.35
2015	418,331	377,443	90.23	40,888	9.77	422,780	124,285	258,304	90.49	40,191	9.51
2016	476,782	371,511	77.92	105,271	22.08	537,399	126,819	305,792	80.50	104,788	19.50
2017	503,526	385,669	76.59	117,857	23.41	570,062	128,863	325,381	79.68	115,818	20.32
2013	489,074	426,560	87.22	62,514	12.78	534,857	134,166	338,366	88.35	62,325	11.65

Source: Annual Budgets, Financial Accounts

Chronicle of Events





Date	Summary	Proposing Unit
01/01-06/03	"The Forest and Me" relocated to Chongqing Science and Technology Museum.	Exhibition Division
01/01-06/30	Screening of 2 films at the 3D Theater: "Gamba" and "Conquest of the Skies".	Exhibition Division
01/01-07/31	Co-organized Sustainable Environment - Water Conservation Expert activity with the Water Resources Agency, Ministry of Economic Affairs (MOEA) and Environmental Protection Bureau, Kaohsiung City Government.	Technology Education Division
01/16	New Children's Building Block Experience Area created at the Candy House.	Exhibition Division
01/16-01/19	CEO of Tech Dome Penang Khong Yoon Loong and 5 other delegates visited NSTM to engage in popular science education collaboration and exchange.	Technology Education Division
01/20	Participated in Taipei City Government's 2018 119 Disaster Prevention Promotion and Firefighting Family Fair, where exhibits such as "Dengue Fever Prevention VR Experience" and "Earthquake Disaster Prevention and Quake Resistant Building DIY" activities were held.	Exhibition Division
01/20-04/08	Co-organized Book of Time - Typography southern Taiwan itinerant exhibition with the Taiwan Typography Culture Preservation Association Ri Xing Type Foundry, and Printing Workshop. The exhibition was conducted at NSTM's Open Storage.	Collections and Research Division



Date	Summary	Proposing Unit
01/20-11/04	NSTM co-organized the Health Science Master at NSTM 2018 lectures with the Taiwan Association for Promoting Public Health, organizing 5 Climate Change-related lectures.	Technology Education Division
01/27-05/16	Held the Kinmen round of the Ministry of Science and Technology's (MOST) "Offshore Island and Peninsula - Nanometer Itinerant Exhibition in Remote Townships", and "Nanometer: The Invisible Scale" at Kinhu Gymnastic.	Exhibition Division
01/29-06/02	"Invention Exhibition" was held at Fengtian Temple in Songshan.	Exhibition Division
02/01-02/28	Launched Year of the Dog - NSTM Promotional Package.	Visitor Services Division
02/14	Signed Vanguards for Foreign Relations Science and Technology International Cooperation - An Exhibition of Achievements exhibition agreement with the Ministry of Foreign Affairs (MOFA).	Exhibition Division
03/06	Collaborated with the Ministry of Transportation and Communications (MOTC) to create Simple Children's Traffic Awareness Park. A grant of NT\$ 4 million was received from MOTC.	Exhibition Division



Date	Summary	Proposing Unit
03/09-03/11	Co-organized "Beauty Power - Time Corridor of Taiwan Women's Fashion" with MOFA. The inaugural exhibition was held at Twin Oaks, Washington, USA, on March 8 (EST), Taiwan local time March 9. The wife of the Representative of the Taipei Economic and Cultural Representative Office (TECRO) to the United States Stanley Kao, Hsiao Fen Sung was invited to deliver the opening speech, and dignitaries who attended the function include John J. Norris Jr., the Managing Director of the Washington Office of the American Institute in Taiwan (AIT), Douglas H. Paal, former Director of the American Institute in Taiwan, Taipei Office, The George Washington University Textile Museum curator John Wetenhall and his wife, as well as Washington Life Magazine Deputy Editor Erica Moody. The second exhibition was held at the Culture Center of TECRO on March 10 (EST), Taiwan local time March 11. The opening speech was delivered by TECRO Deputy Representative Christine Hsueh.	Exhibition Division
03/10	Co-organized 2017-2018 FLL (FIRST LEGO League) and FTC (FIRST Tech Challenge) Taiwan Robot Tryouts with ESUN ROBOT ASSOCIATION.	Technology Education Division
03/13	Signed an agreement with the Southern Region Engineering Office, Railway Reconstruction Bureau, MOTC to carry out the "The bid of Railway Reconstruction Bureau, MOTC project".	Collections and Research Division
03/16-12/31	Co-organized Coloring Taiwan - Dynamic Harbor City with KGAIC at the B1F Gallery.	Exhibition Division
03/16-04/02	Kaohsiung Chinese Art Collectors' Association held the Dialogue between Art and Soul exhibition at the Art Cafe on 2F.	Exhibition Division
03/21	Announced fee guideline for The Technology Window LED screen.	Exhibition Division
03/28	Signed and sealed exhibition relocation agreement for the Invention Exhibition National Science Museum Thailand.	Exhibition Division



Date	Summary	Proposing Unit
03/30	The Ministry of Education (MOE) approved NSTM's 2018 New Southbound Policy for Popular Science Education and International Exchange Project, and agreed to provide a subsidy of NT\$5.1 million. The project includes the Dengue Fever Prevention Itinerant Exhibition, the Program of International Exchange of Rice is Life, and Tech Dome Penang Science Camp Event in Malaysia.	Exhibition Division
04/01	Fantasy exhibition hall partial update completed and opened to the public.	Exhibition Division
04/01-04/30	Organized an exhibition of achievements for the 2018 Promote Senior Citizen Self-Directed Learning Group & Lifelong Learning Activity Pilot Project. MOE presented NSTM with a certificate of appreciation, which was sent to the Archives Room for safekeeping.	Technology Education Division
04/02	Received INFORMATION SECURITY CERTIFICATION BODY's certificate for educational system information security and personal data management regulation.	Information Technology Team
04/03	Hardware upgrades made to the 3D Theater (screening of general movies and 4K resolution 3D films).	Exhibition Division
04/03-04/22	Co-organized the opening ceremony for "Love Water, Save Water, Happy Children's Day" in The Month of Love Water, Save Water, and the obstacle games for the "Go for Saving Water" with the Water Resource Agency, MOEA, and Water Resource Bureau, Kaohsiung City Government.	Technology Education Division
04/11	Operation of Green Living Exploratorium was outsourced to the Youth Bookstore.	Visitor Services Division



Date	Summary	Proposing Unit
04/13-04/14	Co-organized "Disaster Prevention Let's Go and the Rally of Schools with Outstanding Campuses for Disaster Prevention" with the Ministry of Education (MOE) and Ministry of the Interior (MOI) at the Taipei Songshan Cultural and Creative Park. The function was attended by the Chief Secretary of MOE Nan-hsien Chu; the Director General of the Soil and Water Conservation Bureau (SWCB), the Council of Agriculture (COA), Executive Yuan Chen-yang Lee; the Director General of the National Fire Agency, MOI Wen-lung Chen; the Director General of the Water Hazard Mitigation Center, Water Resources Agency, MOEA Chun-ling Kuo; and the Director General of NSTM Shiunn-shyang Chen.	Exhibition Division
04/17-06/20	Kaohsiung Min Tsu Elementary School held the A Decade of Chinese Zodiacs - A Decade of Pottery exhibition at the Art Cafe on 2F.	Collections and Research Division
04/20	Signed the "2018 Tainan Stone Artifacts and Investigation Research Project" Labor Services Procuring Contract with the Tainan Municipal Administration of Cultural Heritage.	Collections and Research Division
04/20-05/31	The Soil and Water Conservation for Disaster Prevention Exhibition was relocated to Hualien Cultural Creative Industries Park.	Exhibition Division
04/21-05/02	Peking University Alumni Association, Taiwan held the Joint Exhibition by Prominent Calligraphers and Painters from Beijing and Taiwan in the art and culture exhibition area on the first floor.	Exhibition Division
04/23-04/30	Director General of NSTM Shiunn-shyang Chen and 2 colleagues traveled to Bursa Science and Technology Centre in Turkey to attend the Turkish Airlines Science Expo. NSTM provided DIY and science demonstrations and signed an MOU with the center.	Visitor Services Division
04/25	Partial update made to the Open Sesame Science Exploration Center, adding a UV Protection Technology exhibit.	Exhibition Division



Date	Summary	Proposing Unit
04/27-07/31	MOE and CTBC Anti-Drug Educational Foundation co-organized the "Understanding Drugs - Uncovering the Truth about Drug Addiction" Anti-drug Special Exhibition at the circular courtyard of NSTM. Dignitaries who attended the opening function on April 27 included the Minister without Portfolio of Executive Yuan Ping-cheng Lo; Political Deputy Minister of Education Ching-hwa Tsai; the Director General of MOE Nai-wen Cheng; Director General of the Department of Prevention, Rehabilitation and Protection; Ministry of Justice (MOJ) Jung-kan Lo; Deputy Mayor of Kaohsiung City Fu-chin Tsai; Vice Chairman of CTBC Anti-Drug Educational Foundation Cho-chun Wang; and Deputy Director General of NSTM Hsieh-tsu Tsai.	Exhibition Division
04/28-05/06	Kaohsiung City Government Education Bureau's "58th Primary and Junior High School Science Fair" was held at the 1st and 4th exhibition hall.	Exhibition Division
04/07-07/08	Store and Keep Memories : Collections of Sound Recordings Exhibition was held at NSTM's Open Storage.	Collections and Research Division
05/06-05/27	Co-organized 8 World Metrology Day metrology scientific knowledge promotion activities with the Bureau of Standards, Metrology and Inspection (BSMI), MOEA, National Measurement Laboratory (NML), and BSMI Tainan Branch Office.	Collections and Research Division
05/12-12/31	Signed a contract with Anyang Municipal Museum to co-organize the Disaster Prevention Educational Exhibition and science and education activities, as well as the promotion of NSTM's cultural and creative products.	Collections and Research Division
05/14-05/15	Conducted MOE's 2018 Affiliated School Documents and Archives Supervisor Education and Training at the South Complex of NSTM. The two-day workshop was attended by 69 students.	Secretariat
05/18	Passed ISO9001:2015 quality management system upgrade certification.	Visitor Services Division



Date	Summary	Proposing Unit
05/18	10 members of Wuhan Science & Technology Society in Hubei visited NSTM's Innovating A Better Future exhibition and participated in an exchange forum.	Visitor Services Division
05/18-12/31	Co-organized the Defeat Myopia to Save Vision exhibition and 4 lectures with Kaohsiung Chang Gung Memorial Hospital's Department of Ophthalmology and Myopia Prevention Center.	Exhibition Division
05/19-05/21	Participated in 2018 Guangzhou Science and Technology Week, conducting 6 popular science demonstrations at the Guangdong Science Center. Director General Chen Shiunn-shyang was also invited to attend the popular science education promotion and achievement exhibition.	Technology Education Division
05/21	NSTM APP (iOS) passed the Industrial Development Bureau's Mobile Application Basic Security Inspection Standard and received medium rating.	Exhibition Division Information Technology Team
05/22-05/24	72 guests from Taiwan Sugar Corporation Tainan Operation Branch visited NSTM to conduct benchmark learning of archive management.	Secretariat
05/26	A staff of 37 from THE GUANGZHOU SOCIETY OF EDUCATION (elementary school and kindergarten department) visited The Diseases Prevention Combat Camp and Adventures in Health Land.	Visitor Services Division
05/29	Attended National Central Library's "International Exchange/Donating Agency Database and Appreciation Function" and received a certificate of appreciation.	Technology Education Division
5/31-8/27	Held the Kenting round of the Ministry of Science and Technology's (MOST) "Offshore Island and Peninsula - Nanometer Itinerant Exhibition in Remote Townships", and "Nanometer: The Invisible Scale" at Kenting Howard Beach Resort.	Exhibition Division



Date	Summary	Proposing Unit
05/31-09/14	Shih Chien University Department of Fashion Styling and Design Communication held the Ding Lao exhibition at the Textiles and Clothing exhibition hall.	Exhibition Division
06/01	12 members of the Sutai Technology Exchange and Training Group visited Recovery and Reconstruction after Morakot exhibition and Innovating A Better Future exhibition.	Visitor Services Division
06/01-10/31	Invention Exhibition Relocated to the National Science Museum Thailand.	Exhibition Division
06/08	8 guests from Kaohsiung Chang Gung Memorial Hospital visited NSTM to discuss museum-hospital collaboration.	Visitor Services Division
06/08	50 guests from Taiwan Railways Administration Kaohsiung Transportation Branch visited NSTM to conduct benchmark learning of archive management.	Secretariat
06/09-08/26	Co-organized Color Gallery with udnFunLife at the 4th and 5th special exhibition hall.	Exhibition Division
06/13	NSTM APP (Android) passed the Industrial Development Bureau's Mobile Application Basic Security Inspection Standard and received medium rating.	Exhibition Division Information Technology Team
06/14-06/25	Promoted science education events for the New Southbound Policy by organizing the Overseas Science Camp - Tech Dome Penang Youth Technology Exchange Workshop. Director General of NSTM Shiunn-shyang Chen signed an MOU with Tech Dome Penang and Penang Youth Development Corporation on June 21.	Technology Education Division
06/15-12/23	Globalization Under the Eaves: Marriage Immigration in Taiwan was relocated to the National Library of Public Information in Taichung.	Exhibition Division



Date	Summary	Proposing Unit
06/21	Entourage of 35 elementary, junior high school principals and directors from Taoyuan County visited NSTM.	Visitor Services Division
06/23-09/04	The Soil and Water Conservation for Disaster Prevention exhibition was relocated to Lanyang Museum.	Exhibition Division
06/26-07/01	Measuring Instruments - Temperature/Humidity/Pressure Collection Exhibition and AR/VR Experience Activity was held at the Open Storage.	Collections and Research Division
06/27	Outdoor public toilet in the North Complex received Environmental Protection Administration (EPA), Executive Yuan's "Outstanding Public Toilets Certification". EPA also held the "Clean Pubic Toilet = Good Mood" video unveiling and Outstanding Public Toilets Award Ceremony.	Secretariat
06/28-08/05	Inaugural exhibition of "Vanguards for Foreign Relations Science and Technology International Cooperation - An Exhibition of Achievements" was held at National Taiwan Science Education Center. Approximately 250 dignitaries attended the function on June 26, including the Minister of Foreign Affairs Jaushieh Joseph Wu, Deputy Minister of Science and Technology Fang-ching Su, Chief Secretary of MOE Nan-shyan Chu, Director General of the National Taiwan Science Education Center Hsuch-yu Chen, NSTM Exhibition Section Director Pei-hsiu Wu, as well as Ambassadors from Nicaragua, El Salvador, Honduras and various other countries.	Exhibition Division
07/01	Updated hardware for the Motorcycle Trip to Fo Guan Shan in the Pavilion of Dream Transport. The exhibit was also opened to the public.	Exhibition Division
07/01	5 guests from the Nanjing Association for the Application of Science Education Bases visited NSTM.	Visitor Services Division



Date	Summary	Proposing Unit
07/02-07/30	Classic Beauty - The Oil Painting Creation Exhibition was held at the art and culture exhibition area on the first floor.	Exhibition Division
07/03-08/31	The Neimen Anthurium Exhibition was held at the Story of Taiwan Agriculture exhibition hall.	Exhibition Division
07/07-12/02	Science and Technology for Disaster Reduction was relocated to Kili Bay Pearl Milk Tea Cultural Center in Yilan County.	Exhibition Division
07/07	12 city councilors from Kumamoto, Japan visited the Recovery and Reconstruction after Morakot exhibition and Explore IoT exhibition.	Visitor Services Division
07/08	Passed the ISO 27001:2013 Information Security Management System re-examination.	Information Technology Team
07/08	BS 10012 International Personal Information Management System certificate was updated to the 2017 version.	Information Technology Team
07/13-07/18	Organized the Theme Exhibition - Smart Earthquake Early Warning System for Chiayi City Government's Science is So Fun Event.	Exhibition Division
07/20	NSTM colleagues traveled to Tech Dome Penang to attend the press conference of the Dengue Fever Prevention Itinerant Exhibition, which was hosted by Deputy Chief Minister of the State of Penang Ramasamy Palanisamy.	Exhibition Division
07/20	Signed an agreement with the National Science Museum Thailand to jointly promote Dengue fever prevention education.	Exhibition Division



Date	Summary	Proposing Unit
07/20-07/31	Conducted Love Angel vote of 2018.	Personnel office
07/21-07/28	Promoted science education events for the New Southbound Policy by organizing the Overseas Science Camp-Singapore Science-Based Touring. Director General of NSTM Shiunn-shyang Chen signed an MOU with Singapore Science Centre on July 24.	Technology Education Division
07/31	Organized metrological relics achievement exhibition, and an MOU was signed between the Deputy Director General of BSMI, MOEA Ling-hui Chen and Director General of NSTM Shiunn-shyang Chen.	Collections and Research Division
08/01-08/31	2018 NSTM Cool Summer 369 summer vacation package allows the public to collect stamps in exchange for prizes using a 3 x 3 grid, where they can advance from 3, 6 to 9 grids.	Visitor Services Division
08/01-08/31	Seeing the Complete Picture from Small Details - Souvenir, Calligraphy Art Exhibition by Yung-ping Su and Chun-hsing Cheng was held at the Art Cafe on 2F.	Visitor Services Division
08/03	7 guests from the Shanghai Association for Science and Technology visited NSTM.	Visitor Services Division
08/03-08/31	Co-organized the Wonderful Brain exhibition with the Mental Health Foundation at the gallery on first floor.	Exhibition Division
08/03-08/04	Guests from the industry, government and academia visited the Vivacious Harbor City - High-Tech Museum exhibition and environmental education guided tour.	Visitor Services Division
08/04	14 principals from Taipei School Alliance visited NSTM.	Visitor Services Division



Date	Summary	Proposing Unit
08/05	5 guests from Busan Tourism Organization visited NSTM.	Visitor Services Division
08/07-08/12	The movie-screening good neighbor initiative for second half of the year attracted 2,271 participants.	Visitor Services Division
08/09-08/12	Co-organized 6th Sony Creative Science Exhibition with Sony Taiwan.	Technology Education Division
08/11	The paid exhibition good neighbor initiative attracted 1,337 participants.	Visitor Services Division
08/13-08/15	Co-organized the Maker's Disaster Prevention Workshop with the Education Bureau, Kaohsiung City Government at True Dream Land classroom, consisting of lectures and teaching aid production.	Exhibition Division
08/16	The National Archives Administration, National Development Council sent a letter informing NSTM that Associate Technical Specialist Chia-hsing Yeh was the recipient of the 16th Outstanding Archivist Award for Government Agencies.	Secretariat
08/20	The Textiles and Clothing exhibition hall was closed from August 20 to October 29, 2018 for partial renovations.	Exhibition Division
08/22-08/26	The Association for Labor Development and Exchange Across the Taiwan Straits rented the 1st special exhibition hall to organize the 2018 Masters of Ink - Joint Exhibition of Calligraphy, Painting and Photography by Artists from Fujian, Hong Kong and Taiwan.	Exhibition Division
08/23	The Science Learning Center science and education team received Physics Education Society of the Republic of China's 2018 Physics Education and Promotion Award.	Technology Education Division



Date	Summary	Proposing Unit
08/25	Organized the Sugar Industry Photo and Image Achievement Exhibition, introducing the Sugar Industry Relics Collection Website and theme photos. The opening speech was delivered by the Director of the Taiwan Sugar Research Institute Chia-che Liu and Director General of NSTM Shiunn-shyang Chen.	Collections and Research Division
08/25	NSTM was invited by Physics Education Society of the Republic of China to sign the Physics Education Promotion Alliance cooperative agreement with the National Taiwan Science Education Center and the National Museum of Natural Science.	Technology Education Division
08/25	Organized the Grandparents Day celebration in the lobby, where Kaohsiung City Government Education Bureau Deputy Director General Chin-yen Wang and the Director General of NSTM Shiunn-shyang Chen jointly presented speeches and awards. The event was attended by 350 teachers, students and grandparents.	Visitor Services Division
08/31	The Ministry of Finance (MOF) dispatched agents to investigate the status of NSTM's financial operations and budget execution.	Accounting and Statistics Office
09/01-12/31	NSTM's Diseases Prevention Combat Camp - Dengue Fever and Influenza was relocated to the Tech Dome Penang in Malaysia. The opening ceremony was hosted by Deputy Chief Minister of the State of Penang, Ramasamy Palanisamy; NSTM Director-general Shiunn-shyang Chen, Deputy Director-general Wu Pei-Hsiu. The Dengue Fever Seminar was held on the same day.	Exhibition Division
09/04	NSTM signed the 5D Flying Theater cooperation agreement with NanE Design Corp. Ltd. for the Kaohsiung City FunTech Park Project.	Exhibition Division
09/04-09/06	Four visitors, including the Section Chief from MOE, visited NSTM to inspect the annual budget execution and the utilization of funds for the projects sponsored and commissioned by the MOE.	Accounting and Statistics Office



Date	Summary	Proposing Unit
09/06	NSTM's Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad took part in the 2018 Asia Pacific Network of Science and Technology Centres Award for Creative Science Communication and became the only prize recipient this year. The award was presented at the 2018 ASPAC annual conference.	Exhibition Division
09/07-09/09	Let's Go, Maker! 2018 Maker Expo@NSTM saw participation from 36 booths. Three maker lectures were held, including the lecture on The Application of Ancient Machinery in Maker Education by Professor Tsung-i Lin from STUST's Department of Mechanical Engineering and Ancient Machinery Research Center; Becoming a Happy Maker by Assistant Professor Kuo-wei Li from the Center for Innovation and Entrepreneurship Education; and The Things Children Taught Me from Those Years by TO.GATHER founder Hsiang-wen Yang.	Exhibition Division
09/11-12/14	Sergeant Hui-ju Hou from the 6th Composite Wing of the Air Force visited NSTM to conduct a routine inspection of the F104 fighter jet exhibit in the Air Navigation and Aerospace Exhibition Hall for Q3 and Q4.	Exhibition Division
09/12	NSTM Associate Technical Specialist Chia-hsing Yeh was the recipient of the 16th Outstanding Archivist Award for Government Agencies. The award ceremony was held at the National Central Library and presented by Premier William Lai.	Exhibition Division
09/13	Passed regular follow-up inspection by Qualicert Service Quality Accreditation for the second year in a row in 2018.	Visitor Services Division
09/14	MOE visited NSTM to conduct the 2018 National Social Education Institute On-site Visit. The activity was carried out by the MOE Department of Lifelong Education Director General Yueh-li Huang and 7 other commissioners.	Secretariat



Date	Summary	Proposing Unit
09/17-11/11	NSTM, MOST, and MOE co-organized the Vanguard for Foreign Relations Science and Technology International Cooperation - An Exhibition of Achievements on the first floor of Wenxin building, Taichung City Hall. The opening ceremony was hosted by Taichung City Mayor Chia-lung Lin, Deputy Minister of Foreign Affairs Szu-chien Hsu, Director of Department of Natural Sciences and Sustainable Development, MOST Min-tsung Lin, MOE Department of Lifelong Education Deputy Director General Pao-yueh Yen, and NSTM Director-General Chen.	Exhibition Division
09/19	Received the SGS ISO9001 Plus Award for QMS Transformation and Innovation Management Benchmark, making NSTM the only museum in Taiwan to do so.	Visitor Services Division
09/20	Updated the 2018 Tang Prize recipient exhibition area.	Exhibition Division
09/21-09/23	Awakening Disaster Prevention DNA is one of the events of 2018 National Disaster Prevention Day stipulated by the Executive Yuan co-hosted by NSTM, Kaohsiung City Government's Office of Disaster Management, the Fire Bureau, Environmental Protection Bureau, Marine Bureau, Public Health Bureau, Agriculture Bureau, Education Bureau, and Sanlien Technological Education Foundation. It includes 8 major theme sections such as fire, earthquake, smog, and disease prevention.	Exhibition Division
2018/09/22-2019/09/01	The Invisible Scale-Nano Exhibition was held at Tainan Children's Science Museum.	Exhibition Division
09/27	MOE approved NSTM's Subsidy for Project for Digital Humanities with Social Education Institutions as the Base - Creating an Industry 4.0 Popular Science Learning Platform program.	Exhibition Division
09/28	Children Science Center - Candy House was updated as a Fun City exhibition hall.	Exhibition Division
09/28	Partial update for Children Science Center - Fantasy World exhibition hall was completed and opened to the public.	Exhibition Division



Date	Summary	Proposing Unit
2018/10/5- 2019/03/03	Soil and Water Conservation for Disaster Prevention exhibition was relocated to the National Museum of Prehistory.	Exhibition Division
10/6- 10/7	NSTM and MOE's Office of Talent Cultivation for the Integration and Application of Clean Energy Systems co-organized the Clean Energy Creative Competition. 6 briefings were held, and the event saw participation by 589 teachers and students from 230 teams. In total, 36 winning teams were chosen, and 158 students received awards.	Technology Education Division
10/07- 12/09	NSTM collaborated with NCKU to organize the 2018-2019 Sunday Science Reading Master Lectures subsidized by MOE. A total of 8 lectures were completed in 2018.	Technology Education Division
10/10	NSTM's exhibit Water Droplet demonstrates cam mechanism application.	Exhibition Division
10/12	Director Ching-chou Lin from Third Maintenance Office, Directorate General of Highways, MOTC and 12 colleagues visited NSTM to conduct benchmark learning of archive management.	Secretariat
10/13	NSTM co-organized Innovative and Characteristic Environmental Education Program - Environmental Education Cross-Industry Integrated Academic and Practical Forum with EPA, Executive Yuan, and the Environmental Protection Administration, Kaohsiung City Government. A total of 16 dissertations were published, and the event saw participation from 150 people.	Technology Education Division
10/14	NSTM's volunteer team received the Best Volunteer Team Award at the 10th Elite Senior Citizen Award, which was organized by the Old Five Old Foundation.	Visitor Services
10/15- 12/03	NSTM collaborated with the Fashion Department of STU to host the handcrafted creative exhibition at the Art Cafe on 2F.	Exhibition Division



Date	Summary	Proposing Unit
10/18	NSTM's Angel of Transmission demonstrates the mechanical transmission principle.	Exhibition Division
10/27	Since NSTM's ISO 50001:2011 energy management system international accreditation was nearing its expiration date, we commissioned SGS to conduct a second-round inspection and once again successfully received accreditation. NSTM was also registered with the Taiwan Accreditation Foundation (TAF) and received a certificate, valid from October 27, 2018, until October 21, 2021.	Secretariat
10/30	NSTM's Maglev Vehicle demonstrates magnetism and gravity.	Exhibition Division
11/09	NSTM's 21st-anniversary celebration "21 Years of Cutting-edge Technology at NSTM - Smart Living in the New Century" and smart manufacturing experience area drew to a successful conclusion at NSTM's east side corridor on 2F.	Visitor Services Division Exhibition Division
11/10	Partial update to the Textile & Clothing exhibition hall was completed and it was reopened to the public.	Exhibition Division
11/21	NSTM and Win Loyal Ltd. signed the VR Gaming Engine Integrated 2-Axis Motion Platform R&D Project cooperative agreement for the Kaohsiung City FunTech Park Project.	Exhibition Division
11/29	NSTM Director General Shiunn-shyang Chen and National Science Museum Thailand President Rawin signed the Exterminator Squad Cooperative Agreement. The duration of cooperation begins on November 29, 2018, and ends on October 31, 2021, where the National Science Museum Thailand is authorized to replicate the teaching aid kit in Thailand to promote Dengue fever prevention education.	Exhibition Division
2018/11/29- 2019/03/03	NSTM, National Science Museum Thailand and Singapore Science Centre co-organized the Rice is Life at the 2nd exhibition hall.	Exhibition Division



Date	Summary	Proposing Unit
11/30	MOC visited NSTM to conduct Museum Assessment, led by Chief Secretary of MOC Teng-chin Chen; the entourage also included 3 assessment commissioners including Li-hang Fang, Sung-shan Wang, and Shang-ying Chen.	Secretariat
12/05	Completed "Wearable e+Clothing Exhibition and Experience Area Planning and R&D Project" for Textile & Clothing exhibition hall.	Exhibition Division
12/14-12/16	NSTM, NKUST, and ASE Cultural & Educational Foundation co-organized 6 rounds of 2018 ASE Sustainable Promotion of Environmental Education Program and Achievement Presentation, which was attended by 1,850 persons.	Technology Education Division
2018/12/14-2019/04/07	NSTM, MOST and MOE collaborated to host the Science & Technology in International Collaboration - An Exhibition of Achievements at NSTM's 3rd exhibition hall. The opening ceremony was hosted by NSTM Director-General Chen, and dignitaries in attendance included the Director General of Department of International Information Services, MOFA Fei-pi Yeh, Deputy Director General of MOST Ching Kuo, MOE Department of Lifelong Education Deputy Director General Pao-yueh Yen, H.E. Ambassador William Manuel Tapia Aleman of Nicaragua, and Chargé d'affaires of Honduran Embassy in Taipei, Taiwan Carlos.	Exhibition Division
12/15-12/16	The 8th Hand Launch Glider Flying Competition consists of "Straight Flight" and "Endurance Flight", taking into consideration the creativity and scientific principles of flight. A total of 525 teachers and students from 150 senior high school and 135 junior high school teams participated in the competition.	Technology Education Division
2018/12/20-2019/03/03	NSTM's Automaton exhibition was opened at the 1st exhibition hall.	Exhibition Division



Date	Summary	Proposing Unit
12/22	NSTM and NKNU co-organized the 2018 Maker Education Teaching Plan Design Competition - Final Competition in the Elementary School Category. Out of 167 participants from 82 teams, 37 participants from 18 teams were selected as prize recipients.	Technology Education Division
12/22	NSTM co-organized the 2018 Smart Living with Cloud Technology - National Cloud Professor Creative Teaching Material Design Activity with the Physics Education Society Taiwan, which saw participation from 17 teams in the final round.	Technology Education Division
12/23	NSTM and NKNU co-organized the 2018 Maker Education Teaching Plan Design Competition - Final Competition in the Junior High School Category. Out of 154 participants from 80 teams, 35 participants from 19 teams were selected as prize recipients.	Technology Education Division
12/23	NSTM co-organized the 2018 National Popular Science Creative Teaching Aid Design Activity with the Physics Education Society Taiwan, which saw participation from 53 teams in the final round.	Technology Education Division
12/25	Video Documentary of Major Earthquakes was added to the Earthquake Education Experience Area.	Exhibition Division
12/25	NSTM and Taiwan Metal Creation Museum Inc. signed the Metal Creative Exhibition and Education Promotion Activity cooperative agreement.	Exhibition Division

List of NSTM Personnel





STAFF

(In Alphabetical Order)

Director-general

CHEN,SHIUNN-SHYANG

Deputy Director-general

TSAI,HSIEH-TSH (retired on 2018/6/30)

Deputy Director-general

WU,PEI-HSIU (assumed office on 2018/8/1)

Secretary

SU,YI-HSIANG

Collections and Research Division

Director - LIN,JONG-I

CHEN,SHU-CHING / CHENG,TING -FANG

HSIAO,KUO-HUNG / HUANG,CHENG-CHONG

HUANG,JUN-FU / LIN,LI-CHUN / LIU,CHING-HO

TSAI,CHIA-JUNG / TSUI,YA-TING / WANG,YAO-HUI

WANG,YUN-YING / WU,CHING-TAI

Exhibition Division

Director -

WU,PEI-HSIU (during 2018/1/1-7/31)

Director -

CHEN,CHI-HSIA (assumed office on 2018/8/1)

CHEN,MEI-TSEN / CHUANG,CHUN-LIN

CHUANG,SHENG-TENG / HONG,WAN-JHEN

HUANG,CHI-HONG / HUNG,HUANG-KAI

JHENG,ZONE-JHE / KAO,SHIH-WEN

LEE,CHIA-FEN / LI,HSING-LIN / LI,JU-CHING

LIN,CHAO-HUNG / LIN,CHEN-YIN

LIN,JIAN-LIANG / LIN,SHIS-TANG /

LIN,SHU-CYU / LIN,WEN-HSIEN

LU,THAO-RONG / SU,FANG-YI / SUN,HUNG YU

SUN,YI-JEN / TSENG,HUI-CHANG

WANG,TSUNG-CHI / WU,SU-HUA

WU,YU-CHUN / WU,YUN-JU / YAN,LI-WEN

Technology Education Division

Director - CHANG CHIEN,CHIH-TING

CHANG,JIA-HWAI / CHEN,CHENGCHIH

CHEN,YI-CHEN / CHEN,YU-HSIN

CHENG,CHIEN-CHI / CHENG,JUI-CHOU

CHUANG,TING-YU / HO,SHU-MIN

HONG,JHIH,MING / HSIAO,DER-REN

HUNG,HSUEH-CHIN / JIANG,SHU-FANG

KUO,HONG-BIN / LIN,CHIH-CHENG

LIN,PEI-YING / LIN,SUNNY-S

LIU,CHIH-YUNG / LIU,JIA-RU

MAI,HSIU-WAN / TSENG,JUI-LIEN

WANG,YU-HUNG / YANG,YI-TING

YEH,CHIN-YU



Visitor Services Division

Director - WANG, LIANG-CHUAN

CHANG, SIN-YI / CHEN, HSIANG-CHUNG
 CHEN, I-WENI / CHEN, JUO-HAN
 CHENG, CHUN-HSIANGI
 CHENG, HSIEN-JENI / CHIU, PING
 CHU, PEI-YINGI / CHUNG, YING-SHIUE
 HSIEH, YA-WENI / HUANG, HUI-TING
 HUANG, PEI-YUI / HUANG, SHIH-TING
 LEE, KUAN-CHINGI / LIN, HUI-CHUAN
 LIN, SZU-YUANI / LIU, FUN-RU
 LIU, JIN-YII / LO, SZU-YI
 PU, CHING-CHINGI / SONG, GIANG
 TSAI, FAN-YII / TSAI, PEI-YING
 TSAI, YUNG-LINI / TSENG, I-HSUN
 TU, MEI-FANGI / WU, YI-NAI / ZOU, JIA-PING

Secretariat

Director

CHEN, CHI-HSIA (during 2018/1/1-7/31)
 Director
 CHOU, WAN-RONG (assumed office on 2018/8/1)
 CHEN, CHUN-AN / CHEN, LIN-YUAN / CHEN, TAI-WEI
 GER, TZU-HSIANG / HORNG, JING-YI
 HSIAO, SHIH-MING / HUANG, PO-SHIN
 JU, YUAN-CHING / KUO, CHUNG-HAO
 LAI, JUO-NAN / LEE, CHIEN-HSING
 LEE, HOUNG-JYH / LEE, SHUN-HSIUNG
 LI, CHANE-WEN / LIAO, MIN-LING
 LIN, WEN-CHIH / LIN, YAO-TING
 LIU, CHIN-HUNG / MO, HSIUNG-WEI
 OU, HUI-LING / SU, PEI-JHEN / SU, YU-JEN
 SUN, MING-SHENG / TSAI, CHENG-TE
 WANG, CHU-LIN / WU, CHENG-CHAN
 WU, CHING-YUN / YANG, LI-WEI
 YANG, MEI-HUI / YEH, CHIA-HSING
 YOU, SHUN-PING

Personnel office

Director - KUNG, CHING-WEN

CHEN, YI-TING
 TAI, MENG-CHUN

Accounting and Statistics Office

Director - FU, CHEN-MEI

HUANG, SHU-JUNG / LIU, SHU-YI
 YANG, TE-WEI



VOLUNTEERS

(In Ascending Orde)

0860456	KUO SHU-TUAN	0860586	TSENG SHU-LING	0860841	KONG FUN-CHUAN	0861101	LIN,CUI-DUAN
0860474	CHUANGT MEN-CHU	0860587	LIN LIANG-HSIU-YUAN	0860845	KU BAIR-HWA	0861103	CHEN SUE-HUA
0860487	CHEN JIA-SHIANG	0860594	TZING-KUN LIN	0860852	SHAO YU-TANG	0861154	LEE SHU-CHING
0860502	TSAI NENG-SHENG	0860599	CHUANG MEI-CHING	0860865	LAI RONG-JER	0861158	HONG KO-MENG-LI
0860511	CHIU YU-MEI	0860609	CHANG,YAN-LING	0860876	CHUNG WU-LING	0861165	HONG KANG-NAN
0860512	LEES-M	0860670	CHEN CHENG-HSIN	0860883	HUANG HUI-LIEN	0861172	WANG CHIN-CHENG
0860513	SHUN SHU-SHAN	0860673	CHANG SHU-MEI	0860929	LEE TZU-CHI	0861173	PENG LAI-YU-HUA
0860539	CHUANG YU-CHUNG	0860705	WANG,CHUN-LIAN	0860945	CHENG CHIN-KUEI	0861174	HSIEH A-MEI
0860541	CHAO LI-FENG	0860707	LAI,HENG-HUA	0860979	SHAN,SHOU-JU	0861177	HUNG HSIN-HUA
0860545	HUANG SHU-HUI	0860712	LIANG CHIN-O	0860995	YANG TSAI	0861179	YEN YIN-IZU
0860549	ZHENG SHOU-YAN	0860714	YANG KUEI-TAO	0861001	KU KUEI-LI	0861188	LOR CHUN-LIN
0860550	YANG LEE-JU	0860715	YANG HSUEN-O	0861004	HUANG CHIUNG-FANG	0861194	TSUI AI-YEN
0860551	TSENG WEN-CHEN-YING	0860716	CHENG SU-FEN	0861006	CHEN KAO-LI-CHU	0861195	LI,JIN-LIN
0860554	CHEN TSUNG-TAR	0860718	CHEN,SHU-YAN	0861014	LEE HSIU-CHIN	0861207	SHIH HUI-CHING
0860557	SHEN MEI-LING	0860743	LIN CHAO-YIN	0861018	LIANG YU-YING	0861233	HUANG KWEN-FENG
0860559	ZHENG,XIU-ZHEN	0860753	CHEN NING	0861039	LEE CHUN-JUNG	0861242	CHEN I-LUN
0860561	TSAI LI-SHU	0860760	HUNG MEI-YING	0861044	WANG,JIAN-HUA	0861256	CHEN PAO-CHU
0860574	HE,YI-TING	0860770	LO YUEH-HSIU	0861046	SUN LU-HUA	0861278	TU PI-LIEN
0860575	HSU CHI-FU	0860781	CHANG KUO-WEI	0861059	LIU,LING-YU	0861283	YANG GAO-GUI
0860580	FU,YU-CHUAN	0860809	TSENG PAO-HUI	0861082	HUNG,HSIU-CHUAN	0861287	TSAO YU-HSIU
0860585	HUANG KUEI-FENG	0860825	LIAO,ZHEN-XING	0861096	SHIAI SHAO-ERE	0861296	WU YUEH-CHEN



0861314 WANG,SHU-CHING	0861640 WANG HUI-CHING	0861763 LI HSIAO-LIN	0870091 LIN WU-MEI-LAN
0861320 LI TERANG-CHUAN	0861645 TSOU HSING-YING	0861765 HUANG SHIH	0870103 TSAI SHU-HSIEN
0861327 CHEN LIANG-PAI	0861649 YANG HSIU-YN	0861781 CHOU CHEN-MEI-WEN	0870110 CHEN,JIN-RUI
0861335 SHIH CHUAN-CHUAN	0861652 HUANG MEI-LAN	0870001 LIN,HUI-ZHEN	0870111 LEE YA-LINE
0861339 LEE FANG-YING	0861653 LIN SHAN	0870010 LIN,XIU-BEI	0870117 CHEN CHUNG-SHENG
0861358 LIANG CHIN-WEI	0861658 HSIEH TSAI LEE-FENG	0870012 SHIH PAO-HSIU	0870127 SU TENG-KUEI-YING
0861370 CHOU FANG-HUA	0861672 CHENG CHIN-CHAI	0870016 YE,YUE-YING	0870130 WU HSIN-HUI
0861400 LIN,HSIU-HUA	0861673 LIU,CHUN-TSENG	0870027 LI SING-HONG	0870131 WU TUAN-MEI
0861410 LIU,XIU-YING	0861674 HSIEH SHIANG-ER	0870033 HUANG CHIU-HSUEA	0870138 SU CHIN-TSUNG
0861416 WU WEN-CHING	0861675 LIN HUI-MEI	0870039 KUO WEN-CHEN	0870141 HO YUAN-PIN
0861419 CHOU HUI-LIEN	0861676 CHUANG PAO-AI	0870058 LIN SHU-WAN	0870144 YANG SHU-FEN
0861421 WU CHING-HUNG	0861677 LI.SU-CHEN	0870059 ZENG,SHU-SHEN	0870149 SHIEH CHI-HUI
0861500 HUANG SU-SHIA	0861678 LEE SHIH-FANG	0870061 YU CHEN PI-LIEN	0870150 YU,SHUN-YI
0861540 CHIH CHEN-KNEI-YING	0861690 CHOU HUA-KUEI	0870070 HUANG TSAI-FZNG	0870152 SHIU LI-CHUAN
0861553 SU SU-HUI	0861694 CHUNG HUI-LAN	0870071 TSAI,YU-CHEN	0870190 TSAI CHIN-CHIH
0861560 LIN HSIU-FANG	0861695 CHEN SU-CHIN	0870075 LIN EN-HSIUNG	0870199 CHEN LI-CHU
0861589 CHOU PEI-YING	0861703 CHEN YOUNG-CHING-MEI	0870077 LIN CHUEN-MEEI	0870202 CHANG HSIU-CHIN
0861590 LEE LI-HSIANG	0861717 GU,LI-CHIN	0870078 CHEN,LI-HUA	0870208 LIN KUEI-CHEN
0861619 LIN PSAI-FA	0861718 LIU,YUE-JIAO	0870084 CHEN,LI-YU	0870226 CHEN MEI-HUEI
0861629 CHANG MAI-LING	0861759 CHEN MAY-LIE	0870085 HUANG LIN-LIANG-HUI	0870229 YANG SHU-HUA
0861630 HU CHIN-CHAI	0861760 WENG,RUI-MEI	0870088 CHEN LI-HUA	0870230 WANG JEN-HSIU



0870231 CHUANG CHIA-NU	0870402 YU JUI-CHIA	0880019 LIU MING-CHU	0880161 CHEN NENG-YU
0870242 LEE LING-FEN	0870403 WEI YANG-HSIU-HUA	0880029 WU CHIN-TUAN	0880179 ZHENG WU,YING-LUAN
0870244 CHEN MEI-CHU	0870411 LIN SU-LING	0880034 WU CHIN-JUI	0880185 WANG,PIH-SIA
0870246 LIN HUI-YANG	0870413 QIAN,LI-ZHEN	0880037 CHAO PI-LIEN	0880195 HUANG HUNG HSIU-CHIN
0870248 LEE SHU-CHEN	0870415 LI,YUAN-XIAN	0880040 WU SU-SHIH	0880236 WANG FENG-YI
0870263 WANG YA-LI	0870428 LIANG,ZHU-YAN	0880041 TIAN CHEN,MEI-ZHU	0880241 LAN MEI-CHU
0870281 CHU,JUI-FANG	0870429 CHENG YEN-PIN	0880045 LIU KE-SHIU	0890006 CHEN HSIEN HUI-LI
0870290 WANG JUI-HAN	0870431 LIN KUEI-MEI	0880046 WU,SHU-YUE	0890008 CHU LI-YU
0870294 KAO FEN	0870446 HONG,QING-XIN	0880050 SU LEE-CHIN	0890009 YU CHEN-YUEH-HSIA
0870300 CHANG SU-YING	0870451 WEN,XIN-LAN	0880054 LU,LI-RONG	0890010 WANG CHIN-HUAN
0870306 ZHENG,LI-XIANG	0870453 CHAO LI-KUEI	0880055 TAI CHING-MEI	0890013 LI HUI-CHEN
0870315 LEE HSIU-HUA	0870459 CHEN YANG-SHOW-CHING	0880058 CAI,ZHEN-FEN	0890018 LIANG,LI-ZHU
0870316 SHIH LI-HUA	0870465 HU XU, XIU-QIN	0880064 TAI CHIEN-HUI	0890019 LIN,GUI-FEN
0870322 CHUANG PI-YUN	0870467 WEI CHANG CHIU-JUNG	0880078 LIN CHEN-MING-SHOW	0890021 LIN,YU-CHIUNG
0870330 ZENG,YAN-HUA	0870483 GUO,MING-ZHEN	0880082 LEE HSIU-HSIANG	0890022 YANG LI-CHU
0870332 HSU WANG-LI-YU	0880002 ZHANG,MEI-FENG	0880086 LIN SHU-CHEN	0890023 CHEN CHUN-TAO
0870333 WANG LEE-BAO	0880004 SU HUI-MIN	0880087 PAO CHIUNG-YING	0890047 CHEN JIAN-LONG
0870338 KUO MEI-JU	0880007 YU JUNG-SHIN	0880093 HUANG,YU-LI	0890062 LIU CHIN-YEH
0870348 LIN,QIN-JUAN	0880010 LIOU SHOU-YING	0880097 SUN YU-CHU	0890065 WU HSIU-LIN
0870362 WEN CHIU-CHU	0880013 YANG LING-FEI	0880123 HUN SHU-YING	0890073 HUANG HAI-PING
0870372 ZHANG,MEI-YUN	0880017 CHUANG CHUN-HUA	0880138 CHEN CHAI-CHIN	0890074 CHANG HUI-HSIEN



0890075 HUANG SHIH-LIAN	0890195 CHEN CHIN-MEI	0900074 HUANG HOU-HSUEH-YUEH	0910040 CHOU YU-CHIAO
0890080 TSAI JUAN-LI-CHUAN	0890197 WU, JIAN-LANG	0900085 WANG YU-CHUNG	0910043 HUANG CHING-MEI
0890083 LUO, YU-MEI	0890198 LEE LING-FIENG	0900086 ZHAO, ZI-WEI	0910047 HUANG MEI-YING
0890084 TSENG SHU-HUI	0890199 WU SU-HUA	0900089 CHEN YUEN-HSIA	0910051 LIU GUO-CHIEN
0890086 LU, XIU-ZHU	0890202 HSIEH TUNG-PAO	0900094 WU MEI-CHIN	0910052 SUN JUI-HUNG
0890097 YANG HSUEH-CHIH	0890203 CHANG MANG-LING	0900098 CHENG CHUANG-CHUEI	0910053 CHEN MING-HUANG
0890109 KUO HSUEH-LU	0900004 XU, TIAN-DE	0900109 WANG, JUN-KAI	0910054 YANG MEI-LI
0890111 LIU CHEN-CHEAN	0900006 LIM SHU-LI	0900125 HUANG FENG-CHIEN	0910088 KUO CHIU-TAO
0890119 TSENG YEN-HSIN	0900008 FENG SHU-JUNG	0900126 CHENG I-CHEN	0910090 CHEN CHIN-CHUEH
0890129 CHANG, YUN-HUA	0900009 CHEN MEI-HUI	0900127 CHEN CHI-YUAN	0910091 SU YUNG-PING
0890132 CHEN, HUI-CHEN	0900010 LEE, YU-YAN	0900133 YEH HSIEN-WEN	0910094 LIN ENG-MIN
0890133 CHENG, HUI-LING	0900014 ZHAO SHU-ZHEN	0900134 CHANG CHIN-YON	0910096 WENG, MEI-CHU
0890140 CAI JIA-JUAN	0900024 LIU YU-HUA	0900139 LIN HUANU-SHU-HSIA	0910098 HUANG CHIEN-CHENG
0890145 CHAO JUI-CHU	0900027 LIEN CHING-YUN	0900141 HSIEH MEI-CHEN	0910099 CHANG CHIN-CHENG
0890147 TING MEI-HUI	0900034 CAI, QIU-YING	0900144 LIN, SHI-LANG	0910100 HUANG LIEN-HSIANG
0890151 WANG, CHIUNG-YUN	0900048 HSIEH PAO-HUA	0900146 HSU SU-CHEN	0910104 TENG CHIN-HSIANG
0890153 HO, SHU-LIU	0900049 LIN MIN-YI	0900151 CHEN KU-LAN	0910110 LAI KE-NAN
0890155 DU SHU-FANG	0900050 CHEN AI-LING	0900152 KUO YU-LING	0930002 CHEN YUEH-HSIA
0890158 CHEN TSAN-CHI	0900052 CHIANG TAI-CHEN	0900158 TU YUAN, LI-DE	0930003 CHOU SHIU-CHU
0890163 LIU MAM-NING	0900053 PENG, CHIH-CHIANG	0910018 XU, YA-TING	0930005 CHANG SU-CHIAO
0890189 KUO FANG-MING	0900055 HSU SHU-YING	0910039 HOU WEN-FU	0930007 HUANG MING-HUA



0930009 HSU LI-HSIA	0930045 WANG CHEN-SHOW-WONG	0930111 HUANG HSUEH-CHIAO	0940029 YANG SHU-YING
0930010 FAN CHENG-YI	0930046 LEE CHAO-FEN	0930119 YANG LING-CHEN	0940033 CHUNG,JUI-HUA
0930011 CHEN HUI-HUA	0930048 TSENG YEN-MEI	0930120 SHAO YI-CHAO	0940036 CHEN YU-YING
0930012 HUANG GWO-SHENQ	0930053 SHYU HUEY-LI	0930124 WU CHEN,SU-YU	0940037 CHEN HSIU-FENG
0930013 YU CHIU-YI	0930055 HSU CHING-HUA	0930127 LIU LIN CHAO-HUA	0940038 CHIU CHI-SHENG
0930014 CHEN LI-CHOU	0930060 CHEN,SHU-NU	0930134 CHEN TLU-CH	0940040 LI,BI-MEI
0930016 SU PAI-WEI	0930061 WANG YA-CHIH	0930138 CHANG LIEN-CHU	0940042 PAN MEI-HSIANG
0930017 CHAN MEI-CHU	0930062 CHANG JUNG-CHUN	0930139 YU KU-YUNG	0940045 SHIH WAN-YI
0930018 CHEN HSIUNG	0930065 LIU FONG-HSIUNG	0930142 SHEN MING-CHIN	0940050 CHEN HSIU-CHU
0930020 CHIANG AN-NAN	0930072 JIAN,ZHENG-NAN	0930147 LI YU	0940051 YANG MAY-JU
0930021 TSAI SU-CHEN	0930073 CHEN,NAI-JU	0930150 LIN JUI-MEI	0940052 YU LEE-MEI
0930022 CHOU SHENG-CHING	0930074 HU YU-LE	0930151 SU JUI-CHUAN	0940058 HUANG WEN-HSIUNG
0930024 LIN BI-CHEN	0930076 WEI,JIN-HUI	0930153 LIN PI-CHAO	0940061 QIU,LIN-YUE
0930025 CHANG YUEH-YUN	0930078 LIN SHU-CHUAN	0930154 HUANG TSAI-YUN	0940063 TUNG WAN
0930026 LEE YU-HSIA	0930081 YIN WEI-HUNG	0940001 CHEN,LI-E	0940064 HOU CHUN-HUA
0930030 LEE MU-HWA	0930087 TSAI LI-HSIANG	0940002 LIU WANG-WAN-MAN	0940067 WEN CHI-CHEN
0930031 KUO CHAO-HSU	0930088 GU,YONG-JIE	0940003 SU CHENG-CHIAO	0940070 LIN HSIU-LING
0930032 LI WANG LI-YU	0930095 LIN,CHIH-CHUNG	0940007 CHIU,YU-LUN	0940080 HUNG YI-WEN
0930036 WANG,HSIU-CHING	0930097 HUANG HSUEN-FENG	0940008 CHUNG CHIG-YEN	0950001 CHOU LIN-CHIU-HSIA
0930043 HSIAO LI-YING	0930102 DAI KO-LI	0940010 SHIH LING-TZV	0950003 CHEN LIN-CHIN-LUN
0930044 LI LI-FENG	0930109 LU SHU-CHEN	0940027 LIN PEI-YU	0950004 YU,SHU-ZHAO



0950005 HUANG SHU-YEN	0950047 LIN,CHUN-HUI	0950084 HSIEH MEI-YING	0950144 SUNG LONG-SHENG
0950007 KUO KUEI-CHU	0950048 SHI XIAO,SEN-ZHI	0950089 KUO CHIUNG-CHU	0950145 LIN SEN-TIEN
0950008 CHANG YUEH-YING	0950049 LEE CHIAJO	0950090 LEE MEI-YUEH	0950147 LIAO,YU-CANG
0950009 HUANG CHIN-PEN	0950051 SU JU-SHU	0950096 LIU SHU-HUI	0950151 HUANG,HE
0950014 LIN CHIN-MEI	0950054 LEE YU-CHIN	0950098 LIU WEN-CHI	0950153 HUANG YU-HSIN
0950015 JU,JIA-LING	0950055 TSAI LI-MAN	0950099 LEE LI-YUN	0950154 CHOU PO-SHIUN
0950019 CHEN,CHUN-ZHU	0950058 LIN,GUAN-RONG	0950104 LIU CHING-HIN	0950156 LIU MEI-MAN
0950020 TUNG SHU-CHEN	0950059 CHEN LINH-LI	0950105 ZHANG,RONG-LAN	0950157 SU,GUANG-ZI
0950023 CHU LIEN-HWA	0950061 TSAI CHIA-YEN	0950112 CHEN,XIU-YAN	0950159 CHANG,KUEI-YING
0950025 WANG CHAO-YUAN	0950062 WU KUEI-MEI	0950113 HSIEH PEI-CHU	0950163 CHEN YI-LI
0950026 CHEN LIN	0950063 TSENG FONG-O	0950116 TSAI SU-CHEN	0950165 SU,XUE-MEI
0950027 WU HUAN-JAN	0950066 WENG,XIU-MIAN	0950119 ZHOU,AI-YING	0950166 WU FU-I
0950028 CHEN CHIH-YUAN	0950067 CHEN SHEN	0950122 LIN LONG-MIN	0950174 YU CHIU-TAO
0950030 TSENG CHUAN-SUNG	0950068 CHEN AI-LING	0950125 CHEN LIOU-JIN-YING	0950175 CHENG,HSIU-CHING
0950031 LU KAI-CHUAN	0950071 TSAI SHU-YUAN	0950128 HOU JHAO-WUN	0950176 LIU CHUN-YUEH
0950034 LEE BAO-NAN	0950076 LEE MING-HUI	0950129 WU SU-CHING	0950177 CHENG MING-HSANG
0950036 ZHANG,LI-MEI	0950077 WANG CHIA-TSENG	0950131 HUNG LI-HWA	0950181 TSAI HSIU-MEEI
0950039 HUANG YU-LAIN	0950078 CHANG HSIAO-HIS	0950134 HUNG JU-RUNG	0950185 CHEN TENG-CHAO
0950044 LU,YA-HUI	0950079 YI CHEN-YU	0950136 TSO TSUNG-YI	0950186 CHAO CHENG-CHIEH
0950045 SUN,YU-HUI	0950080 LAI SHU-YING	0950139 LU DU-MEI	0960001 MA SAI-FEN
0950046 HUANG,HUI-LING	0950081 CHUANG,HSIU-LI	0950140 RUAN,ZHONG-QING	0960002 TANG CHIU



0960005	CHEN,XIAN-YI	0970006	LIN JIA-HONG	0980014	CHANG CHIEN-CHUN	0980053	LIN KUNG-SHU-MAN
0960009	CHEN,YI-MING	0970027	LIN MEI-LING	0980015	CHEN,SHAN	0980054	KUO KUEI-LAN
0960010	XIE,YING-DONG	0970032	HONG,ZHEN-SHAN	0980016	CHIANG HSIU-MAN	0980061	CHUNG MEI-LEE
0960012	CHEN,SHENG-XIONG	0970033	YAO CHU-LI-HUA	0980017	LIN MEI-LAN	0980066	YANG,BI-FEN
0960016	HSI CHING-PING	0970034	HON MI-SHOW	0980018	CHIANG HUI-CHIN	0980067	LIN SHANG
0960017	WANG HSIU-CHU	0970035	CHEN SIANG-SYUE	0980021	WANG NITA	0980074	CHANG,LI-CHING
0960020	YANG ZN-YUAN	0970038	HSU SHIH-CHENG	0980022	CHOU LING-CHUAN	0980081	CAI,CAI-LING
0960022	TSAI JU	0970039	HSIAO LI-CHING	0980025	HSU MEI-JEN	0980082	ZHANG,MEI-JIN
0960023	CHEN NENG-CHI	0970040	YU CHIEH	0980027	HU SHU-CHEN	0980083	LIU,YU-YING
0960029	PAN JIN-LONG	0970041	TSAI CHIA-YI	0980028	CHEN,WEN-SHAN	0980084	LEE LI-YING
0960040	WANG YU-HSIANG	0970042	CHEN SHU-FEN	0980031	CHOU CHIU-LAN	0980085	CHANG CHAW-YANN
0960042	SHEN YANG-CHENG	0970043	HU,JUI-HUI	0980032	LIU,XING-LIAN	0980086	LIN,XIU-LUAN
0960045	HUANG TZU-CHUAN	0970045	HSU CHIA-CHUAN	0980033	LIU HSIANG-JU	0980087	HSU HSIEN-TANG
0960048	CHUNG YAN-SUH-JAU	0970051	CHEN HSIAO-HUAN	0980034	WANG,LI-MEI	0980089	LIN CHUN-SHIA
0960053	WANG CHIU-HSIANG	0970052	CHOU HUI-LING	0980036	LIN DAR-NAN	0980090	YEH,PAO-CHIH
0960054	CHEN,MEI-YIN	0970055	TESNG YUEH-HSING	0980038	HUANG SU-MEI	0980091	CHEN HONG-SHING
0960057	CHEN NAN-SHENG	0980002	YIN JIAN-CHUNG	0980039	YANG HSIU-YING	0980092	YE,MEI-MAN
0960060	XU,YING-YU	0980005	CHIANG YU-YUN	0980042	CHEN TZU-JIUN	0980093	CHANG HSIU-LAN
0960063	CAI,JIN-ZHANG	0980007	CHEN YU-CHIN	0980045	CHEN,ZI-LING	0980095	CHUANG CHEN-CHIN-YUEN
0960072	YANG HSUEH-FEN	0980012	CHEN,JIE-PING	0980046	PENG HUI-CHEN	0980096	CHEN LEE-HUA
0970004	WENG TZU-SHUAN	0980013	LI YUN-YIN	0980050	LIN MEI-FEI	0980100	PAN FU-TSUN



0980101	CHANG CHIEH-YUN	0990040	CHANG MING-SUNG	0990066	TSAI HSUEH-HSIANG	1000026	WU, JIN-GUI
0980102	LEE SHU-FEN	0990042	LIU, YU-LAN	0990067	HSU KUEI-JEN	1000027	LIAN, SHENG-LIN
0990004	LAI, KUN-YI	0990043	WANG, ZHENG-NAN	1000001	LO YU-HUA	1000028	YANG, YI-AN
0990005	TSENG, YU-LUN	0990044	HSU CHIH-MING	1000003	HSIAO CHIN-CHAO	1000029	WU TSUN-NENG
0990006	CHEN, CHUN-HSIUNG	0990045	CHANG LI CHIEH-YIN	1000005	YEH PAI-MEI	1000030	HUANG YI-CHENG
0990010	JIN, CUN-SHAN	0990046	CHEN YUNG-CHIANG	1000006	HSU SHU-CHUN	1000034	CHU MAN-CHEN
0990011	XIE, ZHI-LING	0990047	CHOU YEONG-CHI	1000007	CHENG CHEN-SU-LUAN	1000035	HSIEH HO-MING
0990013	TUNG CHENG-LIANG	0990048	CHEN SHUI-WANG	1000008	CHENG CHI-MING	1000036	FANG SHU-LING
0990015	LEE YI-HOUN	0990050	CHEN YI-CHUN	1000009	TSENG YEN-HUANG	1000037	TSEN HUI-CHAO
0990016	JIANG, HUI-TIAN	0990051	CHEN WAN-FU	1000010	WEI CHIN-SHUN	1000039	TAO EN-TE
0990017	QIU, JIN-CHENG	0990053	CHENG RUEY-SHAN	1000012	KUO YU-CHING	1000040	WU CHIU-HUAN
0990019	HSU, HSIN-CHU	0990054	HE, XIA-ZHI	1000013	WANG LUNG-YUAN	1000041	HSU MING-FU
0990020	HUANG KUN-TSE	0990056	LEE YURN-CHONG	1000014	YUAN YA-CHIN	1000043	ZHUANG, ZAN-LI
0990021	CHEN HSIU-HUA	0990057	LIN SHOU-SHAN	1000015	JUAN YUEH-YUN	1000044	LIN RONG-BIN
0990024	SHI, XIU-ZHEN	0990058	LIU CHIN-CHIH	1000017	ZHUANG, JIN-ZHI	1000045	FENG YU-KUEI
0990025	KUO CHING-MEI	0990059	HSU, YUEH-YING	1000018	HUANG SU-HUA	1000046	LIN SHIU-SHIA
0990026	LEE MIAO-CHEN	0990060	HUANG CHIN-HUEI	1000019	CHEN PI-ER	1000047	WU SHIU-CHU
0990028	LU FU-MEI	0990062	LIN HUI-LI	1000020	TSAI CHEN-YUAN	1000048	CHEN MAI-YEN
0990029	CHEN, MEI-YING	0990063	LIU YEN-CHUN	1000022	CHANG FU-SHAN	1000049	SONG, LI-ZHU
0990030	CHU YU-FANG	0990064	HUANG JEN-TSUNG	1000023	LAI, MING-HONG	1000050	CHAN CHIN-YUEH
0990031	TONG, MING-CONG	0990065	YAN SHU-ER	1000025	HUANG HUI-HIS	1000053	LIU MEI-HSUEH



1000054 CHEN YUAN-MING	1000091 LEE,HSIU-CHU	1000130 PENG,GUANG-TANG	1000159 TUNG,WEN-SHIANG
1000055 CHUNG LO-CHUN-YING	1000093 YANG WEN-CHUAN	1000132 LUO,JIN-DAO	1000160 ZHENG,XING-XING
1000056 HU CHIA-LIN	1000097 LO CHIEH-TSUN	1000134 LEE SHAO-MEI	1000161 WANG KUANG-HSIEN
1000057 LI,JIN-LING	1000099 KUNG LEE-SU-FEN	1000136 XIE,GUAN-ZHENG	1000162 HU,QIU-MEI
1000059 KUO HSIANG-JUI	1000100 KUNG TING-HUI	1000139 RUAN TANG,FENG-JIAO	1000163 WU,KUEI-HSIANG
1000062 TSAI HSIU-CHIN	1000101 YU CHIH-HUA	1000141 CHEN,PI-CHU	1000165 LIN HOU,XIU-ZHU
1000064 CHANG MAY-CHING	1000103 HUANG YANG-CHIH-HUI	1000142 LU,SHAO-YU	1000166 LU,XIU-ZHU
1000070 CHIU HSUEH-LING	1000104 YANG,CHAO-QUN	1000143 LU,JIN-DUAN	1000167 CHEN,SHU-DAN
1000071 YAN,YU-RU	1000105 LI,DE-XING	1000144 SHI,NAI-YING	1000168 LIU,MING-LI
1000072 WEN HUI-YEN	1000107 LIN,BI-ZHU	1000145 CHIU,SUE-CHEN	1000169 TAO,SHU-CHIN
1000073 YEN CHING-KAO	1000108 YANG HSIU-CHAO	1000146 WANG,TE-SHENG	1000170 YANG TSAI-CHUAN
1000074 ZHENG,BO-XIONG	1000110 YEH,HSIU-JUNG	1000147 ZHENG LIN,XIU-ZHU	1000171 XIE,FU-ZHEN
1000075 YU MING-HO	1000117 WU,CUI-HUA	1000148 LAI,HE-JING	1000172 CHEN,CHUN-MAN
1000076 GUO,ZHEN-ZHEN	1000118 HUANG YU-CHUAN	1000149 LU,JIAN-CHENG	1000173 ZHANG,YU-MEI
1000078 LEE TI-PEI	1000119 LIN YU-YING	1000150 WANG LI,BI-XIA	1000174 WANG PAI-KUNG
1000080 HUANG PO-HSIANG	1000120 YANG CHING-YUN	1000151 CHEN,QING-SONG	1000177 CHEN,RUI-YING
1000081 PAN CHIEN-MEN	1000121 CHANG,LI-CHUEH	1000152 CHENG,LI	1000178 CHUANG,YUNG-JEN
1000084 LI,YAN-XIANG	1000123 LIN,DE-YU	1000153 CHANG PAI-LIEN	1000181 SU,TUNG-CHUN
1000087 HUANG MEI-CHI	1000125 LIN LI-CHENG	1000154 YE,RUO-YI	1000182 LIN,CHING-YING
1000088 CHEN CHUN-KUANG	1000127 HUANG WEI-PING	1000155 HUANG LI,CHUN-QIN	1000183 LI,MING-JANE
1000090 HSIEN,YU-CHIN	1000128 SHEN MEI-FENG	1000157 WU,YIN-TIAO	1000184 LI,QING-XIAN



1000185	CHEN,ZHI-SHENG	1010001	LI,CHUN-HUI	1010029	ZHANG,ZHUO-XIAN	1010060	CHEN,XIANG-JUN
1000186	WEI,JU-HSU	1010003	LU,JING-XIAN	1010030	WA,CHAO-JUNG	1010062	HE,GUI-YUE
1000187	KO,NAI-HUA	1010005	CHOU,YU-CHING	1010031	CHIU,PEI-DE	1010063	TIEN,JIA-HUI
1000188	LIAO,YI-CHUN	1010007	WANG,ZAI-FU	1010032	CHEN,MEI-CHING	1010064	DING,HUI-MEI
1000189	HUANG,MEI-LAN	1010008	WANG CAI,MEI-HUI	1010034	JUAN,LU-CHIANG	1010065	SU,HSIU-LI
1000191	HUNG,JUNG-YI	1010009	ZHENG HUANG,YU-XIU	1010035	CHEN,JING-KUAN	1010066	LI,LIAN-LIAN
1000192	CHEN,YI-HUI	1010010	CHEN,YI-LONG	1010037	JIANG,RUO-ZHEN	1010068	GUO,XIU-YING
1000193	CHANG,FENG-CHEN	1010011	YE,HUI-MIN	1010039	CHEN,YUN-JUAN	1010069	ZHUANG,XUE-YU
1000195	WU,PI-YUN	1010012	HUANG,XIAO-ZE	1010040	LIU,HSING-KUEI	1010070	WANG,SHAO-HSIN
1000197	HSU,JIN-WEN	1010013	HSU YUEH-YEH	1010042	SHI,FANG-JIN	1010073	CHEN,XIU-XIA
1000199	WANG,SHUN-HIEN	1010014	MAI,SHU-CHING	1010044	LI,YI-JU	1010074	CHANG,YUE-NU
1000202	CHOU,HSIU-CHUN	1010015	ZHANG,LI-XUAN	1010047	HSU,CHENG-TUNG	1010075	LIU,SHAO-ZHANG
1000203	PAN,TSUNG-MIN	1010017	YE,LI-HUA	1010048	CHUANG,PI-CHUAN	1010076	HUANG,HUI-YIN
1000204	CHEN,GUEY-SHIANG	1010018	RAO,YU-TING	1010050	CHOU,SU-JEN	1010080	YU,DE-XIAN
1000205	WU,MING-ZHU	1010019	HSU,MING-HSIU	1010051	WU,WEN-LI	1010081	HUANG,YAN-HUI
1000206	TAN,HAI-LIN	1010020	SHI,YU-YING	1010052	GUO,CHUN-CHING	1010082	ZHANG,SUI
1000207	LU,ZONG-MING	1010022	YANG,SEN-GUI	1010053	TZENG KUEI-YU	1010084	LIN LEE-HUA
1000208	LI,YUNG-CHI	1010023	WU,SHU-YUAN	1010055	YU,SHU-FANG	1010085	HUANG WAN-WAN
1000211	FU,CHUN-YING	1010024	CHEN,ZHEN-MEI	1010056	HSIEH,HSIU-LI	1010086	XIE,QIN-CHENG
1000213	HU,RUEI-SHIAN	1010025	TSAI,MIAO-YUEH	1010058	ZHAO,SHU-ZHEN	1010088	LIN HSUEH-HUI
1000216	TSAI SHU-CHIN	1010026	SU,YUE-LI	1010059	LU,PEI-HUA	1010089	LIN KUEI-CHU



1010090 CHIU KIN-SHUN	1020021 YANG,BI-HUI	1020046 WANG,SZU-KO	1030005 YU HSIANG-KUO
1010091 ZENG,YU-JING	1020023 XIE,LI-XUAN	1020047 KUO SOONG-YU	1030006 FENG,HUI-HSUEH
1010092 LEI,SHAO-YING	1020024 CHEN,CHIN-YU	1020048 XIE,CHUN-MAN	1030007 CHOU CHIH-HAO
1010093 CHEN,KUEI-CHU	1020025 LIU,XIU-YING	1020049 LIN,JIN-YAN	1030008 HSU CHU-FEN
1010094 CHEN,LING-NA	1020026 LIU LIN,SHU-YA	1020052 LIN,JUN-LI	1030009 LI,CHIN-KUO
1010095 YAO,HUI-JI	1020027 CHEN,CHIN-ZONG	1020054 PENG,YOU-YU	1030010 CHANG PAI-YU
1020001 CHEN HUI-CHU	1020028 CHEN,JU	1020055 GUO,GUI-XIANG	1030011 LIU,HSUEH-CHU
1020002 SONG,YUE-YING	1020029 CHEN,PEI-LIN	1020058 YI,QING-LING	1030012 LIN CHIN-CHEN
1020003 ZHANG,TIAN-YONG	1020030 JIANG,YING-XUAN	1020060 GUO,CHUN-QING	1030013 CHEN,FU-CHIN
1020004 FANG TSUNG-RAN	1020031 ZHANG,TIAN-XIN	1020061 DAVID TSENG	1030014 CHEN MEI-LIN
1020006 WANG,XIN-LEI	1020032 WANG LIN,YUE-YING	1020062 YE,SHU-ZHEN	1030015 TSAI,HSIU-TUAN
1020007 SUN I-NAN	1020033 CAI,LAN-XIANG	1020063 CHAN CHIU-YING	1030016 YANG,CHENG-YUNG
1020010 CHEN CHIH-FANG	1020034 CHANG,TSUI-HUA	1020064 QIU,XIAO-ZHU	1030017 HUANG,HSIU-LI
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Ms. Zeng,Yan-mei	10,000	Shu-Te Home Economics and	10,000	Team	
Ms. Zhang,Min	10,000	Commercial High School		○○ Computer Co. Ltd	10,000
Ms. Zhang,Shu-mei	10,000	Sie-Da Metal Industrial Co., Ltd.	10,000	○○ Healthy exercise	3,600
Ms. Zhen, ○○	10,000	Sin An Seen Kindergarten	10,000		
Ms. Zhen, ○○	10,000	Slam literature cram school	10,000		
Mu Mian Group	3,500	Southern United Service Center	82,150		
Mutual Industrial Co., Ltd.	10,000	Southern Wen Ci Foundation	10,000		
Nianci Kindergarten	10,000	Foundation			
Nova' Spirit International Co., Ltd.	10,000	Sun Chia Church	50,000		
NSTM Aerobics Society	10,000	Sunfar Computer Co., Ltd.	1,100,000		
NSTM Exhibition second volunteer	10,000	Taiwan Yun Dow Buddhism	10,000		
NSTM Friday on the theater	10,000	Cultural Exchange			
volunteer		Taiwan Yun Dow Buddhism	253,650		
NSTM health slimming exercise	5,000	Cultural Exchange			
Orchid dance club	1,000	Teacher Cai,Xue-ping	29,580		
Ms. Zhong,Yue-Lan		Teacher Lu,Jin-liu	3,960		
Outstanding Cram School	10,000	The Corporate Body of Yuan	10,000		
Private St. Yi kindergarten	10,000	Dao Cultural & Educational			



National Science and Technology Museum

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