

A Survey of the Distribution of the Facilities Supporting Students' Out-of-School Science Activities and Their Programs in Korea

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ABSTRACT

Students experience science not only through school science lessons but also through various other channels. Science-related facilities, including science museums and centers, are important channels for informal science education. Korea has a number of governmental and private facilities in which young people can experience various aspects of scientific activities, and many of them also provide the programs supporting out-of-school science activities. However, there has been no systematic survey study on those facilities providing out-of-school activities, thus they have not been used effectively as well as their social utility is not fully realized. To this end, in 2002 researchers of this study carried out surveys (1) of the facilities supporting out-of-school science activities and (2) of science programs provided by these facilities. The surveys show that there are approximately 180 facilities supporting science activities in Korea. More than 40% of them are located in Seoul and Gyeonggi areas. Among them, the proportion of special theme science museums was the greatest (37.9%). The facilities supporting out-of-school science activities usually do not target the specific age groups but are intended for all people. The proportion of governmental facilities exceeds that of private ones. 41.8% of the facilities examined in this study run their own science activity programs. Among the 10 categories of the programs, 'science class' type programs were the most common. There were more programs for elementary and middle school students than preschoolers, high school students and adults. The contents of the programs were more related to astronomy and meteorology, the observation of living things and field trips. Despite their high practical potential, the special theme science museums were found to be lacking in relevant programs, which could fulfill their values for informal science education.

Key words: out-of-school science activities, science-related facilities, science programs, science museum, science center

I. Introduction

Recently Korea has gone through a serious socio-cultural phenomenon of avoiding the study of science and engineering. Considering the situation of Korea, which has no natural resources except human resources, this phenomenon must be very serious for the future of the country. In

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order to attract more young people into the field of science and engineering, it is essential to provide the educational opportunities to them so that they both realize the usefulness of science and technology and experience them with excitement in day-to-day contexts.

Fortunately nowadays a lot of social efforts have been made to promote the popularization of science and technology and to broaden the science culture in Korea. At the same time, a number of governmental and private facilities in which young people can experience various kinds of scientific activities have been constructed and many of them also provide the programs for supporting out-of-school science activities.

Science-related museums and other informal science settings such as zoos, parks, aquariums, science centers, and botanical gardens, are informal sources of learning that impinge on science education(Wellington, 1994), and these can contribute greatly to the understanding of science and encourage students to further their interests outside school.

Science museums - used as a generic term to include science museums, science centers, natural history museums, zoos, and gardens - carry out various functions including educational, socio-cultural, economical and political roles. That is, science museums are the place for the communication, informal education, and the culture of science and technology (Im, 2001). Especially science museums and centers in Korea aim to be the institutions for providing education while science museums in the west generally have been considered more as some kind of cultural expression(Cho, 2002). Science museums are expected to play key roles in science education by showing the past, the present and the future of science and technology and by creating a scientific atmosphere(Pak, 1983). And the researches have shown that the experiences in science museums or centers, for example interaction between visitors and exhibits, influence the affective and cognitive domains of science learning(Gregory, 1989; Wellington, 1989; Feher, 1990; Stevenson, 1991; Beiers & McRobbie, 1992; Rix & McSorley, 1999).

In spite of these wide functions and roles, however in Korea, there have been no systematic collection, review, analysis of these various facilities providing out-of-school science activities, thus they are not utilized effectively. Although Choi(1996), Lee(1996), Kim(1999), and Kim(2003) performed the survey studies on the facilities supporting out-of-school science activities including science museums, the surveys were very limited. Systematic information about science-related facilities and scientific activities is not provided enough to students, parents and science teachers.

On the basis of the background, this study carried out the surveys

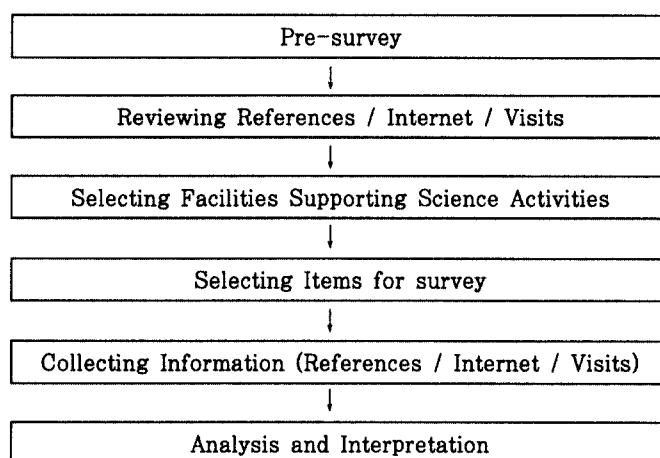
- (1) of the facilities supporting out-of-school science activities and
- (2) of science programs provided by the facilities.

Facilities supporting out-of-school science activities that this study indicates contain both complex science museums such as National science museum, National Seoul Science museum, Science Research Institute that aim for science activities and science education and other facilities whose exhibits and programs are related with science education (e.g. special theme museums, observatories and professional institutes for the research related to science).

II. Method

At first stage of this survey information of science facilities was collected by reviewing various references, published books, papers and reports related to science museums, by web surfing and by visiting them. And the classification depending on their characteristics and items for concrete information to be collected were made. Then, the information about the facilities was collected and analyzed on each item. New information came out continuously while collecting and analyzing informations, so some information and facilities were excluded. This study was conducted throughout the year of 2002.

The process of this survey is as follows.



III. Procedure and Findings

1. Surveys of the facilities supporting out-of-school science activities

1) Items for survey

In the pre-survey, science facilities were classified into some groups according to the region in which each facility is located, to its governing body, to the goal of the facility, and to the contents exhibited.

Governing bodies of facilities are classified into national government, provincial government, and private one. There are three categories on the basis of the goal of facilities. The first one is the facility whose main goal is on the science activities, the second one is the facility whose goal is partially on the science activities. The last one is the facility whose goal is not on the science activities however they can be used for the purpose of science activities. Regarding the contents of science, facilities could be divided into three categories: contents containing general science; contents related to specific theme of science; and contents which are little related to science. In order to collect concrete information about each facility, finally 15 items were decided. Among these we analyzed distribution of facilities according to region, type, target, governing body and the existence of homepage.

- Name
- Governing Body
- Program/ Event
- Way to go
- Homepage address
- Goal
- Guide for use
- Major Target
- Region
- Introduction
- Contact
- Subject
- Type
- Content of exhibits
- Map

2) Distribution of the facilities

As a result of this pre-survey, there were more than 350 science facilities including science museums. We divided the facilities into 7 categories, according to which science facilities for the survey were chosen. When deciding whether a facility belong to science facility or not, specially in case of specific theme museums, we considered whether the exhibits and programs are related to science activity or not. We finally selected 177 facilities to be studied and analyzed them in terms of the distribution of region, type, main target, governing body and the existence of homepage. <Appendix 1> shows the science facilities included in this survey and the distribution of them according to type and governing body.

Regional distribution

177 science facilities were classified into those located in capital, metropolitan city and provinces. Top 3 regions show the science facilities are mostly located in Seoul (43/24.3%), Gyeonggi (35/19.8%), and Gyeongsang (20/11.9%). Since Busan, Daegu and Ulsan have been industrial cities, there are facilities related to the industrial works, where the programs of visiting factory are run as a part of company's advertisement. But these are excluded in this study because these were not regarded as educational science activities. As shown in Table 1, considering the populations of the regions, science facilities were represented more in Daejeon, Gangwon and Jeju while less in Busan, Incheon and Daegu. Gangwon and Jeju which are known as famous resort areas appeared to have relatively more science facilities while most metropolitan cities, except Daejeon which is known as science-technology oriented city and has many Professional Institutes for Science Related Research, had relatively less science facilities.

Table 1. The distribution of science facilities according to the region

Region	N(%)	Population Ratio (2000)
Seoul	43 (24.3)	21.4%
Gyeonggi	35 (19.8)	19.4%
Gyeongsang	20 (11.9)	12.4%
Chungcheong	16 (9.0)	7.2%
Daejeon	12 (6.8)	3.0%
Jeolla	12 (6.8)	8.4%
Gangwon	11 (6.2)	3.2%
Busan	7 (4.0)	8.0%
Jeju	7 (4.0)	1.1%
Incheon	4 (2.3)	5.4%
Gwangju	4 (2.3)	2.9%
Daegu	3 (1.7)	5.4%
Ulsan	3 (1.7)	2.2%
Total	177(100.0)	100.0%

Institution Type

Science facilities were classified into 7 types, Education and Science Research Institutes, Science Museum and Natural Science Museums, Children's Centers and Amusement Parks, Arboretums and Botanical/Zoological Gardens, Special theme Science Museums, Institutes Related to Korean Traditional Sciences and Professional Institutes for Science Related Research. The first one is governmental institute belonging to each provincial office of education. These institutes mainly take charge of each province's science education. So the feature for science education supporting school science was outstanding. Children's centers were usually located in amusement parks and are similar to science centers in a small scale. In the process of searching we have noticed 'special theme science museum' such as 'Korean Gas Science Museum', 'Charmsory Gramophone & Edison Museum', 'Coal Museum' etc. Even though these facilities were not complex science museums, they had many exhibits related to science and had great possibility to be utilized as science learning places. The topics of the special theme science museums were quite diverse across various areas related to science and technology, including such as nature (e.g. geology, fossil, ocean), environment (e.g. ecology, forest), industry (e.g. agriculture, fishery, silk thread, coal, gas, telecommunication), finance (e.g. money), transportation (e.g. railway, vehicle, lighthouse, airplane), traditional culture (e.g. Korean Traditional music, Gimchi, life-history, land), people (e.g. children, family), everyday-life (e.g. medicine, paper, fire-engine, lamp, jewelry), and hobby (e.g. audio, movie, pottery).

Among them, the percentage of special theme science museums was the highest, 67(37.9%). Arboretums and Botanical/Zoological Gardens which exhibited the living things were 35(19.8%), while Natural History Museum was just 7(3.9%).

Table 2. The distribution of science facilities according to type

Type	Example	N(%)
Education & Science Research Institutes	SESRI(Seoul Education and Science research institute)	16 (9.0)
Science Museums and Natural History Museums	National Science Museum	14 (7.9)
Children's Centers and Amusement Parks	Korean Children's Center	12 (6.8)
Arboretums and Botanical/Zoological Gardens	National Arboretum	35 (19.8)
Special theme Science Museums	Korean Gas Science Museum Taebaek Coal Museum	67 (37.9)
Institutes Related to Korean Traditional Sciences	Shilla Art and Science Museum	10 (5.6)
Professional Institutes for Science Related Research	Korean Meteorological Administration	23 (13.0)
Total		177(100.0)

Target visitors

Target visitors of each facility were different according to the goals of establishment and features. Target visitors were divided into five groups: preschoolers, elementary school students, middle school students, high school students and adults. Facilities were multi-checked out when they were judged to aim at more than one target group.

The facilities for elementary(middle(high school students were more than 90% while the facilities for preschoolers were just 3(1.7%).

Table 3. The distribution of science facilities according to target visitors

Target visitor	N(%)*
Preschoolers	3 (1.7)
Elementary School Students	169 (94.9)
Middle School Students	174 (97.8)
High School Students	164 (92.1)
Adult	155 (87.1)

* % : The percents represent the proportion of the number of the facilities targeting each visitor group out of the total member 177 of the facilities.

Governing Body

Governing body of facilities was classified into National Government, Provincial Government, Private facility, University and others. Private ones were further divided into Corporate and Individual. The percentage of provincial facilities was the highest, 74(41.8%), and then private facilities 59(33.4%), national facilities 24(13.6%), university 13(7.3%).

Table 4. Classification according to governing body

Governing Body	N(%)
National Government	24 (13.6)
Provincial/municipal Government	74 (41.8)
Private (Corporate)	35 (19.8)
Private (Individual)	24 (13.6)
University	13 (7.3)
Others	7 (4.0)
Total	177 (100.0)

Internet Homepages

It was surveyed if the facilities had their own Internet homepages. The facilities that had their own homepages introduced much information in detail such as the introduction and guidance for visit etc. But the facilities that have no homepages also provided the brief introduction through the homepages of the local autonomous organization or superior organization. The facilities were analyzed whether they have their homepages or not, according to the type and governing body. The facilities having Internet homepages were 137(77.4%) out of 177.

Table 5. The proportion of science facilities having internet home-page

Category of facilities' feature	N*/N**(%)
Education and Science Research Institutes	16/16 (100.0)
Science Museums and Natural History Museums	11/14 (78.6)
Children's Centers and Amusement Parks	7/12 (58.3)
Arboretums and Botanical/Zoological Gardens	28/35 (80.0)
Special Theme Science Museums	47/67 (70.1)
Institutes Related to Korean Traditional Sciences	6/10 (60.0)
Professional Institutes for Science Related Research	21/23 (91.3)
Total	137/177 (77.4)

N* : number of facilities that have internet home-page
N** : total number of facilities in each category by type

All the Education and Science Research Institutes operate own internet homepages. The proportion of having homepage was relatively high in Professional Research Institutes, Arboretums, and Science Museums. But, in case of Children's Centers and Institutes Related to Korean Traditional Science, the proportions of having homepages were relatively low. 23(96%) of all 24 national organizations had their own homepage while the proportion (70.8%) of having homepage was the lowest in the private (individual) facilities.

Table 6. The proportion of science facilities having own internet home-page

Governing Body	N*/N**(%)
National Government	23/24 (96.0)
Provincial/municipal Government	54/74 (73.0)
Private (Corporate)	29/35 (82.9)
Private (Individual)	17/24 (70.8)
University	11/13 (84.6)
Other	3/7 (42.9)
Total	137/177 (77.4)

N* : number of facilities that have internet home-page
 N** : total number of facilities in each category by type

2. Survey of science programs provided by the facilities

1) Items for survey

In this part, we carried out a survey of science programs provided by the facilities in 2002. The subjects of this survey were limited to programs that the facilities provide for science activities. Science programs here mean programs and events that each facility plans and runs, excluding the permanent exhibits. For the information of each science program, 12 items were collected. In this paper, we present the results focusing on the distribution by type of program, schedule, target of program and domain of content.

- Name of facility
- Name of program
- Type of Program
- Schedule
- Target of program
- The number of expected participants
- Main subject
- Name of sub-program
- Domain of content
- Expense
- Resources for education
- Human resources /Department

2) Distribution of the science programs

Providing science programs

The survey showed that facilities providing science programs were 74 in number. Table 7 shows the ratio of running science programs according to the type of facilities. All the Education and Science Research Institutes whose main goal is supporting science education provide various science programs. Of Science Museums and Natural History Museums, National Science Museum and National Seoul Science Museum were providing various types of programs. But Amusement

Parks, Special theme Science Museum and facilities related to Korean Traditional Sciences provided a few science programs. Although the Special theme Science Museums (e.g. TaeBaek Coal Museum and Agriculture Museum) have high practical potential for science education because of their exhibits related to science contents, many of them did not provide separate science programs.

Table 7. The proportion of science facilities providing science programs

Science Facilities Type	N*/N**
Education & Science Research Institutes	16/16 (100.0)
Science Museum and Natural History Museums	6/14 (42.9)
Children's Centers and Amusement Parks	4/12 (33.3)
Arboretums and Botanical/Zoological Gardens	17/35 (48.6)
Special theme Science Museums	14/67 (20.9)
Institutes Related to Korean Traditional Sciences	1/10 (10.0)
Professional Institutes for Science Related Research	16/23 (69.6)
Total	74/177 (41.8)

N*: number of facilities that provide science programs
 N**: total number of facilities in each category by type

Program type

The science facilities were providing various science programs. Some of them were related to formal school curriculum and others not. Pak (2000) categorized out-of-school science activities into 'activity constructing content by oneself', 'activity of meeting scientist and science research places', 'activity through media' and 'science playing and recreation'. The features of out-of-school science activity depend on who manages programs. Judging based on the kinds of programs provided, we identified 10 categories: Science classes, Science Camps and Observation Activities, Field Trips and Visits, Competitions and Tournaments, Science Lectures, Audio-visual Presentations, Special Exhibits, Science Festivals, On-line Learning, Science Play.

Table 8 shows the results of science programs analyzed according to program types. Among the types, Science Classes were most common as 38.2%. Also, Science Camp and Observation

Table 8. Program types run by science facilities

Program Type	N(%)
Science Classes	114 (38.2)
Science Camps and Observation Activities	79 (18.1)
Field Trips and Visits	20 (4.6)
Competitions and Tournaments	78 (17.9)
Science Lectures	24 (5.5)
Audio-visual Presentations	15 (3.4)
Special Exhibits	37 (8.5)
Science Festivals	35 (8.0)
On-line Learning	27 (6.2)
Science Play	7 (1.6)
Total	436 (100.0)

Activities type was the second as 18.1% and 'Competitions and Tournaments' type was also common as 17.9%.

Schedule of the program

The science programs were classified according to when they were provided: 'throughout the year', '1st academic term', 'summer vacation', '2nd academic term' and 'winter vacation'. For example, a program proceeded from April to September was multi-checked as 1st academic term, summer vacation and 2nd academic term.

The result showed that programs were provided more in the first half year including summer vacation (68.3%). Vacation program also were provided more in summer vacation (22.9%) rather than winter vacation (5.5%). The reason for this is suspected that winter is not suitable for most out-door activities and also that programs are planned and run according to annual budget system.

Table 9. Schedule of the program

Time	N (%)
Throughout the year	85 (19.5)
1st academic term	198 (45.4)
Summer vacation	100 (22.9)
2nd academic term	84 (19.3)
Winter vacation	24 (5.5)
Total	436 (100.0)

Target population

Target groups of the program were varied widely: preschooler, elementary school students, middle school students, high school students, teachers, parents, adult, and all.

The results say that the programs that elementary 5-6th grade students could participate were the most (respectively 69.7% and 69.3%). The proportions of the programs targeting elementary or middle school students were higher than that of programs targeting high school students or adults. The proportion of science programs targeting preschoolers was relatively small (31.0%). And the proportion targeting all age groups was only 27.5%.

Program Contents

The contents of the programs were categorized into 14 domains (See Table 11.). The program which could not be categorized into a single domain was multi-checked. Among the programs, the programs related to Astronomy and Meteorology were most common as 25.7%, and the programs concerning biology were next common as 22.9%. This is considered to reflect the characteristics of the domain of Biology and Earth Science, which have lots of outdoor activities traditionally. The third common programs were related to Physics. Science museums appeared to have more exhibits in the area of physics than in biology and earth science. However the programs for physics were not well represented compared with those for biology and earth science. In the domain of science subject in school, chemistry-related programs were comparatively little (13.3%). The proportion of craft and design programs was higher (13.9%) than other domains.

Table 10. The Distribution of Programs According to Target Population

Target Population	N*	N**	Ratio of available program (%)
Preschooler	15	135	31.0
Elementary School	1 st	129	57.1
	2 nd	130	57.3
	3 rd	144	60.6
	4 th	151	62.2
	5 th	184	69.7
	6 th	182	69.3
Middle School	1 st	127	56.7
	2 nd	130	57.3
	3 rd	119	54.8
High School	1 st	86	47.2
	2 nd	83	46.6
	3 rd	81	46.1
Teacher	35	155	35.6
Parents	38	158	36.2
Adult	74	194	44.5
All	120		27.5
Other	6		1.4
Total	436		

N*: the number of the programs that target specific age group

N**: the number of available programs = the number of programs that target specific age group (N*) + the number of programs for all groups (120)

Table 11. The Distribution of Programs According to Content

Content	N (%)
Physics	242 (18.7)
Chemistry	173 (13.3)
Biology	297 (22.9)
Astronomy and Meteorology	333 (25.7)
Geology and Oceanography	164 (12.6)
High Technology	62 (4.8)
Liberal Science	74 (5.7)
Practical and Domestic Science	41 (3.2)
Craft and Design	181 (13.9)
Invention	18 (1.4)
IT Education	37 (2.9)
Environment	95 (7.3)
Traditional Science	51 (3.9)
Mathematics	10 (0.8)
Total	1297 (100.0)

IV. Conclusion and Discussion

This study intended to survey the actual state of the facilities supporting out-of-school science activities in Korea by collecting and analyzing the basic information of science programs provided by those facilities.

Surveys of the facilities supporting out-of-school science activities

In this survey we selected the science facilities supporting science activities and collected basic information such as name, region, introduction, guidance and others that are necessary for people to visit those facilities and to use the programs there. After that, these collective data were analyzed according to type, target, governing body and existence of homepage.

There were 177 facilities supporting science activities in Korea. More than 40% of them were located in Seoul and Gyeonggi areas. Among them, the proportion of special theme science museums was the greatest (37.9%) and arboretums and botanical/zoological gardens with living things were 35(19.8%) while Natural History Museums were just 7(3.9%). Most facilities supporting out-of-school science activities usually do not target specific age groups but are for all age groups. In governing body, the number of provincial facilities was the greatest by 75(42.1%), and then the private facilities by 59(33.1%), national facilities by 24(13.5%) and university facilities by 13(7.3%). Three fourths of all facilities have their Internet homepages. However, many private facilities don't have their own homepages as we expected.

Survey of science programs provided by the facilities

The data of programs of each facility were collected and analyzed according to the program type, schedule, target and contents. The proportion of facilities providing science programs was 41.8%. In distribution by program type, Science Classes containing many sub-activities were the most common (38.2%). Science Camp and Observation Activities type, which contains science camps and observation activities of heavenly body and living things, and Competitions and Tournaments type were also very common respectively 18.1%, 17.9%. In distribution by schedule, many programs were in progress throughout the year, but more programs were provided in the first half of the year including summer vacation. In distribution by target group, the programs for the students in elementary 5-6th grade to take part in were the most. The proportion of the program targeting elementary and middle school students was higher than that targeting high school students and adults. In distribution by contents, programs relevant to astronomy and meteorology were the most in 25.7% and ones relevant to biology were in 22.9%.

What kinds of implications could be drawn from this survey?

The first is that there are many facilities that might play a role as a place for science education more than our expectation. Especially Special Theme Science Museum and Institutes Related to Korean Traditional Science were such things. If we turn our attention to these facilities, even though the numbers are not big, there could be many good places for out-of-school science education.

There were some science facilities that provided the programs contributing to science education and to the popularization of science with usual scientific exhibits, like National Science Museums. Some other science facilities, such as Professional Institutes for Science Research, also provided science programs for science education even though they had no exhibits in

display. However, this survey showed there were many facilities that did not provide any science program except equipping some exhibits related with science. For example, TaeBaek Coal Museum was one of them. In order that these special theme science museums, whose exhibits possess high potential for science education, are to be used for informal science education, appropriate programs using those exhibits need to be developed.

Most science facilities did not target specific age groups. Preschool education is very important for their high potential and preschoolers need specialized educational program. Thus, science programs and facilities, specially designed for that particular group, are needed.

Science programs were provided more in the first half year including summer vacation than in the second half year. This result implies that more programs need to be provided in winter. In summer, there could be many other kinds of outdoor activities instead activities inside science facilities. But it would be difficult to do activities outside the facilities in winter, and the winter vacation period is much longer than the summer vacation in Korea.

Another point to consider is the fact that programs for high school students and adults are less than those for elementary and middle school students. It shows that present science facilities focus on spreading the knowledge of science and education for young people. In order that science facilities, such as science museums, not only contribute to spreading the knowledge of science and to the popularization of it but also become place for cultural activities, the appropriate programs are most essential, with perception about various roles of science museum and a lot of effort to realize them.

Due to the limit of space, the details (such as, address, map, internet homepage address, major exhibits, information for visit, name and contents of programs) of the facilities surveyed in this study could not be included in this paper. The information can be found elsewhere (Song *et al.*, 2002; <http://grants.scienceall.com>).

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Appendix 1

The Facilities Supporting Students' Out-of-School Science Activities in Korea

Types	Governing Body	Science Facilities
Education & Science Research Institutes	PG (Provincial Government)	Seoul Education & Science Research Institute, Busan Education & Science Research Institute, Daegu Education & Science Research Institute, Incheon Education & Science Research Institute, Daejeon Education & Science Research Institute, Gwangju Education & Science Research Institute, Ulsan Education & Science Research Institute, Gyeonggi Education & Science Research Institute, Gangwon Education & Science Research Institute, Chung Cheong Nam-Do Education & Science Research Institute, Chung Cheong Buk-Do Education & Science Research Institute, Jeonnam Education & Science Research Institute, Jeonbuk Education & Science Research Institute, Gyeongnam Education & Science Research Institute, Gyeongbuk Education & Science Research Institute Jeju Education & Science Research Institute
Science Museums and Natural History Museums	NG (National Government)	National Science Museum, Seoul National Science Museum
	PG	Busan Marine Museum, Danghangpo Natural History Exhibition, Gwangju Science Center
	P(Private)	LG Science Hall, LG Science Hall in Busan, Jeju-Di Folklore & Natural History Museum, Eunam Natural History Museum, Yecheon Space Science Center for Children
	U(University)	Ehwa Womans University Natural History Museum, Kyunghee University Natural History Museum, Hannam University Natural History Museum
Children' Centers and Amusement Park	PG	Busan Children Hall, Chuncheon Children's Center, Daegu Children's Center, Gwangju Children's Center, Cheongju Children's Center, Jeonbuk Children's Center
	P	Korean Children's Center, EXPO Science Park, IT World, Woobang Towerland, Everland, Lotte World
	NG	National Arboretum, Hongnung Arboretum
Arboretums and Botanical/Zoological Gardens	PG	Youido ecological Park, Gamae Arboretum learning center, Saneung Arboretum learning center, Wild Flower Garden, Ulsan Grand Park, Gyoungsangnado Arboretum, Naeyounsan Arboretum, Wando Arboretum, Meedongsan Arboretum, Chungnam Keungang Arboretum, Jeju botanical garden Yeomiji, Seoul Grand Park Botanical Garden, Incheon Grand Park, Gangwondo Provincial Arboretum, Jeonju Arboretum, Namsan Arboretum, Seoul Grand Park, Children's Park Botanical Garden, Gildong Ecological Park, Halla Arboretum, Namsan Park
	P	The Bunjae Artpia, The Garden of Morning Calm, Mirim Botanical Garden, Korea Botanic Garden, Gungang Park Botanical Garden, Key-chungsan Botanical Garden, Korea Bonsai Research Institute, 63 Building Aquarium, COEX Aquarium, Busan Aquarium,
	U	Gwanak Arboretum
	NG	the Fisheries Science Museum, Geological Museum, National Railroad Museum(in Bugok), National Railroad Museum (in Seoul), Traditional Music Museum, The National Folk Museum of Korea, Jinju National Museum, Cheongju National Museum, The Korean National Maritime Museum, Jeonrabukdo National Forest Museum, National Museum of Korea, Agricultural Exhibition Hall Korea Forest Research Institute
Special Theme Science Museums	PG	Boryung Coal Museum Incheon Metropolitan City Museum, Janggigot Lighthouse Museum, Jeollanamdo Fisheries Exhibition, Shellfish Exhibition Hall, Chungchungnamdo Forest Museum, Korea Gas Science Museum, Bank of Korea Museum, Currency Museum, Gyeonggi Provincial Museum, Mungyoung Coal Museum, Tomb of King Sejong, Nature and Ecology Museum, Taebaek Coal Museum, Hwajinpo Maritime Museum, Fire Fighting equipment Exhibition, Post Museum, Land Museum of Korea
	P	Kyungbo Fossil Museum, Kyesung Paper Museum, Onggi Folk Museum, Museum of Korea Straw and Plant Handicraft, Korea Deung-Jan Museum, Edison Museum (Bucheon), Jeju Jeju Shinyoung Cinema Museum, Charmsory Gramophone & Edison Museum, Haekang Ceramic Haegang Ceramics Gallery, Gimchi Museum, Samsung Children's Museum, KT Science Museum, Aerospace Museum, Handok Museum of Medicine, Agricultural Museum, Jewelry Museum, Sericultural Museum, Pacific Museum, Kumho Family Land, Samsung Transportation Museum, Onyang Folk Museum, Pan Asia Paper Museum, Korea Telecommunication Museum
	U	Seoul National University Museum of Medicine, Suk Joo-Sun Memorial Museum, Korea University Museum, Yonsei University Museum, Seoul National University Museum, Kyunggi University Museum
Institutes Related to Korean Traditional Science	PG	Suwon Hwaseong Fortress, Cheomseongdae Observatory, Haeinsa Temple, Seokbinggo Ice Stone House, The Early Printing Museum of Cheongju,, Seoul Museum of History, Seoul Education Museum
	P	Shilla Art and Science Museum, Korea Architectural Museum,, King Sejong Great Memorial Hall, Korea Folk Village
Professional Institutes for Science Related Research	NG	Korea Meteorological Administration, Korea Intellectual Property Office, Korea Aerospace Research Institute, Bohyunsan Optical Astronomy Observatory, Milky Way Astronomical Observatory, Korea Institute of Energy Research, Korea Astronomy Observatory, Air Force Academy
	PG	Daejeon Observatory, Jongro Fire Station, Korea Science Foundation
	p	Na Il-Sung Observatory, Sejong Astronomical Observatory, Astronomical Observatory, Astrovillage, Youngwol Observatory, Ansung Observatory, Teke Observatory, Sangkoo Astronomical Observatory, Cosmopia Observatory
	U	Hankuk Aviation University, Kyugheo Observatory