Development of the Next Generation - Summer and Spring Science Schools for Junior and High School Girl Students

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The Physical Society of Japan
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1. History background
2. Activities
3. Advantages of girls’ science school
Background

Proportion of female researchers, 2013

Low % of Japanese female researchers
JPS

Number and Percentage of Women in JPS

Target ➤ 30%
After 180 years!?
History

In order to increase # of Japanese female researchers→
Increase # of female students

2005  The Japanese summer girls’ science school started.
  • Stimulated by Korean Physics summer camp
  • Supported by Japan Inter-Society Liaison Association Committee for Promoting Equal Participation of Men and Women in Science and Engineering (EPMEWSE), National Women Education Center of Japan (NWEC), and Japan Science and Technology Agency (JST)

  Great success! Over 100 high school girls joined the science camp form all over Japan.

2006  The Japanese spring girls’ science school started in west area of Japan.

Since then, summer and spring girls’ camps have been carried out every year.
  The 11th summer girls’ school → Aug. 6-8, 2015
Summer and Spring girls’ Science Schools

Summer Science School
- Since 2005
- 120 junior and high school students and 50 parents and teachers from all over Japan
- 2 nights 3 days camp
- Volunteers (researchers, technithians, teachers, students, NWEC staffs)
- >30 Academic societies

Spring Science School
- Since 2006
- 120 junior and high school students, 30 parents and teachers from Kansai area
- 5 events and 1 night 2 days camp
- University staffs and students

Supported by JST project “the program of encouragement for girls to choose science courses” 3 million yen/year 1.5 million yen/year
Spring Girls’ Science School
(In 2015: Kobe Univ. and other 4 universities)

6 events (Students can join a part.)

(1) July 26, 2015
Opening, Lectures of female researchers in company, talk with girls’ Univ. students @Kobe Univ.

(2) Aug. 3, 2015
Science tour to ship donk in Kobe Univ. @Kobe

(3) Oct. 18, 2015
Experiments @ Osaka Univ. and Nara women Univ.

(4) Nov. 15, 2015
Experiments @ Osaka Pref. Univ. and Kyoto Univ.

(5) Jan., 2015
Science tour to computer center @Kobe Univ.

(6) Mar. 20-21, 2015
Science camp of experiments and presentations, Closing @Kobe Univ.
Summer Girls’ Science School

Aug. 6-8, 2015

Aug. 6
Opening,
Carrier Lectures (Women researchers in company, graduate female student)
Science battle (Quiz, collecting stamps)
Group discussion of parents and teachers

Aug. 7
Experience the future in science course
Science café
An astronomical observation
International exchange with foreign students
Poster exhibitions and carrier counseling with members from 36 academic societies and associations
Carrier planning

Aug. 8
16 Experiments proposed by academic societies and associations
Closing
36 academic societies and associations support the camp in 2015.

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<tr>
<th>No.</th>
<th>団体名</th>
<th>テーマ</th>
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<tr>
<td>1</td>
<td>一般社団法人日本生物物理学会</td>
<td>WHY BIOPHYSICS(生物物理)？</td>
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<tr>
<td>2</td>
<td>日本蛋白質科学会</td>
<td>蛋白質の形と働き</td>
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<td>日本発生生物学会</td>
<td>生き物の形作りに学ぶ</td>
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<td>4</td>
<td>公益社団法人日本化学会</td>
<td>世界で活躍する女性化学者ー皆さんもチャレンジしよう</td>
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<td>5</td>
<td>公益社団法人日本天文学会</td>
<td>宇宙を観る・宇宙を知る〜天文学最前線で活躍する女性研究者から〜</td>
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<td>6</td>
<td>地球電磁気・地球惑星圏学会</td>
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<td>7</td>
<td>「分野・地域を越えた実践的情報教育協働ネットワーク」女性部会(WiT)</td>
<td>火災から命と財産を守る〜鉄の世界・鷺が広がる</td>
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<td>8</td>
<td>独立行政法人国立高等専門学校機構</td>
<td>面白いぞ！材料科学</td>
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<td>9</td>
<td>J-Win 第4期技術系分科会</td>
<td>(1)ハンドパワー (2)不思議な原理</td>
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<td>10</td>
<td>日立技術士会「チーム・技魔女」</td>
<td>あなたの今将来の原動力・放射線</td>
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<td>日本のエネルギー</td>
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<td>一般社団法人電気学会</td>
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<td>日本地形学連合</td>
<td>結び方と数学</td>
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<td>14</td>
<td>公益社団法人日本地球惑星科学連合</td>
<td>夢をかちたに〜</td>
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<td>15</td>
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<td>特定非営利活動法人日本分子生物学会</td>
<td>(1)低炭素社会を築く</td>
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<td>公益社団法人日本電磁波エネルギー応用学会(JEMEA)</td>
<td>電子レンジ(マグネットレンジ)</td>
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<td>25</td>
<td>公益社団法人日本火災学会</td>
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<td>公益社団法人日本金属学会</td>
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<td>一般社団法人日本鉄鋼協会</td>
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<td>28</td>
<td>一般社団法人日本原子力学会</td>
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<td>WIN-Japan</td>
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<td>一般社団法人日本物理学会</td>
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<td>一般社団法人日本木材学会</td>
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<td>34</td>
<td>一般社団法人土木技術者女性の会</td>
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<td>35</td>
<td>関東学院大学土木系女子学生の会</td>
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<td>36</td>
<td>特定非営利活動法人日本電磁波エネルギー応用学会(JEMEA)</td>
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Activity 1: Experiments

3-4 Hours Experiments (Girls’ Spring school)

Junior high school students

- “Mysterious Taste”
- “World of ultra-low temperature”
- “Make a clean energy”
- “Find out bacteria”
- “Solar and Heliospheric Observatory”
- “Paleoclimatology ~ Climate estimated by stone”
- “Try out computer simulation”

High school students

- “Person who can drink alcohol a lot or not”
- “Science of thunderstorm”
- “Make a clean water”
- “Catch cosmetic ray”
- “Present from earth”
- “Kinetics of spaghetti”
- “Make crystal radio”
- “Simulation of Astronomy”
- “Story of Tasting”
Experiments

Unison of human and music by accelerated sensor

Experience of Superconductivity

Measuring radiation
**Activity2**:  
**Presentation of experimental report**

After doing experiment

• Preparation in each group
• Poster or oral presentations
• Introduction of experiments to friends and parents

**Significance**:  
● Deeper understanding about experiments by preparing ppt
● Deeper understanding by asking questions to teachers
● Increase of communication ability in a team
● More learning by listening and asking about other students’ presentations
● Make Friends
In 2009  Junior open Lab

Catch Cosmetic Ray

In 2007 Science Cafe

In 2007 Science Cafe
Activity3: Discussion with female researchers

- Lectures
- Discussion
- Scientific tours
- Discussion with Girls’ students (Experimental teaching assistant, committee members, OG)

In order to make image of their future in detail after they chose science course.
Activity 4:
Exchange discussion with Korean girls

Korea-Japan Exchange Program

2008                      2009

Initiation  Interaction  International
Advantages of Girls’ Science School

- Enjoy science ➔ very important (for us too!)
- Do experiment for themselves (Students have little experience in junior and high school)
- Effect to parents and teachers
  (in case of joining events and get information of newsletters)
- It is very important that students feels “interesting!”
- Let the barrier to choose science course lower
Significance of Girls’ Science Schools

- Removal prejudice that girls usually choose liberal arts, pharmacy, or doctor courses.
- Parents and teachers make big influences to students.
- Female students can make friend and be relaxed. (Nobody likes to enter field where there are few females.)
- There are many cases that alumni (graduates) become TA, and researchers, who come back to science school again.

At first, we let girls’ student enjoy science, and get rid of uneasiness, and show blight feature.

Graduates come back to science school again as supporting stuffs, such as TA, teachers, and researchers.
## Comparison of two camps

### Differences

<table>
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<tr>
<th></th>
<th><strong>Summer camp</strong></th>
<th><strong>Spring camp</strong></th>
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<tbody>
<tr>
<td><strong>Start year</strong></td>
<td>2005</td>
<td>2007</td>
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<tr>
<td><strong>Venue</strong></td>
<td>National women education center of Japan (NWEC, Saitama)</td>
<td>5 Univ. of Kansai area (Kobe, Osaka, Kyoto, Nara, Osaka pref.)</td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td>1 night 2 days in Aug. (2005)</td>
<td>1 night 2 days in Mar. (2007-2009)</td>
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<td>2 nights 3 days in Aug. (2006-)</td>
<td>3 events and camp. (2010)</td>
</tr>
<tr>
<td></td>
<td>2 nights 3 days in Aug. (2006-)</td>
<td>4-5 events and camp (2011)</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td>National women education center of Japan (NWEC, Saitama)</td>
<td>NPO (2007, 2008)</td>
</tr>
<tr>
<td><strong>Executive committee members</strong></td>
<td>Volunteers (researchers, technithians, teachers, students, NWEC stuffs), Academic society members</td>
<td>Each University (2009)</td>
</tr>
<tr>
<td><strong>How many students join?</strong></td>
<td>From all over Japan Junior and high school students 100 (2005-2012), 120 (2013) Parents and teachers 50 (2008-)</td>
<td>Kansai areaを中心に60人（2006年度）、80-90人（2007-2011年度）、150人（2012年度）、120人（2013年度）他保護者・教員30人</td>
</tr>
<tr>
<td><strong>Event contents</strong></td>
<td>講演、実験・実習、ポスター展示、先輩との対談、クイズ</td>
<td>実験・実習、その発表（サイエンスカフェ風）、講演、先輩との対談、研究所見学</td>
</tr>
<tr>
<td><strong>特徴</strong></td>
<td>女子大学生（学部・大学院）ボランティアが企画から参加、30以上の学会等によるキャリアアドバイス、女子中高生の継続的交流、国際交流、卒業生活用（サイエンスアンバサダー）</td>
<td>実験・実習を重視、グループによる発表コンテスト、付き添いの親・教員も参加</td>
</tr>
<tr>
<td><strong>学協会の協力</strong></td>
<td>30以上の学会からのキャリアアドバイス、一部学会からの景品提供</td>
<td>一部学会からの寄付金、景品提供</td>
</tr>
</tbody>
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JST project “for junior and high school 女子中高生理系進路選択支援事業”に毎年採択され、継続的発展的に実施。