SCIENCE MENTORSHIP PROGRAMMES 2011

Applied Science Programme (ASP)

Biotechnology Programme (BP)

Defence Science Programme (DSP)

I^2R Mentorship Programme (I^2R-MP)

Nanyang Polytechnic Explorations in Science & Technology (NEST)

NTU-Mentorship Programme (NTU-MP)

NUS-Computer Mentorship Programme (NUS-CMP)

NUS-Engineering Mentoring Programme (NUS-EMP)

NUS-Science Mentorship Programme (NUS-SMP)

RP-Human Performance Programme (RP-HPP)

RP-Science Exploration Programme (RP-SEP)

Science Centre Mentorship Programme (SC-MP)

SMPs Handbook

for mentors

Organised by:

Gifted Education Branch, Ministry of Education

With:

Defence Science & Technology Agency
DSO National Laboratories
Institute for Infocomm Research
Nanyang Polytechnic
Nanyang Technological University
National Institute of Education
National Parks Board
National University of Singapore
Ngee Ann Polytechnic
Republic Polytechnic
Singapore Polytechnic
Science Centre Singapore

CONTENT

WORKPLAN FOR YEAR 2011

SCIENCE MENTORSHIP PROGRAMMES

DATE	ACTIVITY / TASK	ACTION BY
11 Oct 10 – 12 Nov 2010	SMP 2011 Online Application	School Co-ordinators
12 Nov 2010	Submission of Project Proposals	Institutional Coordinators
31 Dec 2010	Release of project allocation results for Phase 1	GEB
21 Jan 2011	Release of project allocation results for Phase 2	GEB
Fri, 28 Jan 2011 2.30 p.m.	**Official Launch of Science Mentorship Programmes (SMP) @ Ngee Ann Polytechnic, Lecture Theatre 45**	Participants, new Teacher-Advisors, School Co-ordinators, Institution Co-ordinators
Jan to May 2011	Mentorship Attachment – 3 hours weekly	Participants and Mentors
9 Feb 2011 (Wed)	**RMM 4 - Scientific Method & Experiment Design @ Science Centre**	Participants
25 Feb 2011	Submission of Research Plan to Mentor, Teacher-advisor and School Coordinators	Participants (Mentor to note)
4 Mar 2011	Submission of collated Research Plans to GEB	School Co-ordinators
16 May 2011 (Mon)	Submission of Progress Review to Teacher Advisors and Mentors	Participants
11 May 2011 (Wed)	**RMM 5 - Scientific Writing – It is more than the lab report @ Science Centre**	Participants
27 May 2011 (Fri)	Collate and submit of Progress Review to GEB	School Co-ordinators
30 May – 10 Jun 2011	Full time Mentorship Attachment - 2 weeks	Participants and Mentors
3 June 2011 (Fri) 3.00 p.m.	Meeting of 17th Youth Science Conference Organising Committee at 51 Grange Road, GE Seminar Room, Blk 1 #01-10	YSC Organising Committee
1 July 2011 (Fri) 3.00 p.m.	Meeting for School Co-ordinators & Teacher Advisors at 51 Grange Road, GE Seminar Room, Blk 1 #01-10	School Co-ordinators & Teacher-advisors
Jun – July 2011	1. Pupils to work on research paper and submit to Teacher Advisor 2. Teacher-Advisor to vet research paper 3. Pupils to send vetted research paper to mentor for amendments	Participants, Teacher Advisors, Mentors
22 July 2011 (Fri)	Submission of final approved version of paper to mentor by pupils	Participants
22 July 2011 (Fri)	Submission nomination of emcees to GEB	School Co-ordinators
27 July 2011 (Wed)	Submission of soft copy (Microsoft Word of pupils' final approved research reports to respective institution coordinators.	Mentors
27 July 2011 (Wed)	**RMM 6 - Presenting your research findings @ Science Centre**	Participants
29 July 2011 (Fri)	Submission of soft copy (Microsoft Word) of pupils' research reports to GEB.	Institution Co-ordinators
12 Aug 2011 (Fri)	Submission of names of judges for poster exhibits	Institution Co-ordinators
Aug – Sep 2011	Preparations for Posters Presentations	Participants, Mentors & Teacher Advisors
9 Sep 2011 (Fri)	**SMP Poster Judging @ Nanyang Auditorium, NTU**	ALL
16 Sep 2011 (Fri) 12.30 pm	17th Youth Science Conference Rehearsal	VIP Presenters and emcees
17 Sep 2011 (Sat) 9.00 a.m.	**17th Youth Science Conference @ Nanyang Auditorium, NTU**	ALL
26 Sep 2011 (Mon)	Completion of online feedback forms	Participants, Teacher-Advisors, Co-ordinators, Mentors
7 Oct 2011 (Fri) 2.30 p.m.	SMP After Action Review Meeting (Debrief and planning for 2012)	Institution Co-ordinators & GE Branch

SMP Website URL: http://www.moe.gov.sg/education/programmes/gifted-education-programme/special-programmes/science-programmes/science-mentorship-programmes/

AN OVERVIEW

Philosophy
We believe that strong interest in any area provides unequalled internal motivation and acts as a powerful driving force along the way of self-directed and independent learning. Along that inspired road, an encounter with a mentor can be the beginning of a rewarding lifelong learning experience. We strive, through the Special Programmes, to stoke that special passion in the individual learner and open doors for those with the aptitude, interest and commitment.

Mission
The Science Mentorship Programmes are structured to develop interest and talent in scientific research amongst our pupils. It provides opportunities for pupils with interest and aptitude in science to deepen their knowledge in a particular area, to learn about the latest research developments and to be challenged by the intellectually stimulating process of scientific research.

Structure
The science mentorship programmes comprise the following separate programmes:

- ASP, BP, DSP, I^2R-MP NEST, NTU-MP, NUS-CMP, NUS-EMP, NUS-SMP, RP-HPP, RP-SEP and SC-MP (Scientists as Mentors)
- School-Based Science Mentorship Programme (Teachers as Mentors)

ASP, BP, DSP, I^2R-MP, NEST, NTU-MP, NUS-CMP, NUS-EMP, NUS-SMP, RP-HPP, RP-SEP, SC-MP

Aim

These are structured with the aim of developing pupils' interest and talent in scientific research. It provides opportunities for pupils with interest and aptitude in science to deepen their knowledge in a particular area, to learn about the latest research developments and to be challenged by the intellectually stimulating process of scientific research.

Objectives

- To provide enrichment that includes current scientific advances to expose pupils to the cutting edge in science
- To enhance pupils' understanding of major concepts and theories in science
- To develop skills for conducting investigations and inquiry in science
- To stimulate and nurture pupils' interest in science
- To provide opportunities for pupils to interact with teachers and scientists for a better understanding of the activities, beliefs and traits good scientists should have
- To motivate pupils to take up scientific research to benefit mankind

Target Group

Secondary 3 and 4 SBGE, IP and selected non-GEP pupils

Organisation

The following external science mentorship programmes are jointly organised by the Gifted Education Branch with the following institutions:

- Applied Science Programme (ASP)
  - Singapore Polytechnic (SP)
- Biotechnology Programme (BP)
  - Ngee Ann Polytechnic (NP)
- Defence Science Programme (DSP)
  - Defence Science and Technology Agency (DSTA)
- I^2R Mentorship Programme (I^2R-MP)
  - Institute for Infocomm Research (I^2R)
- Nanyang Polytechnic Explorations in Science and Technology (NEST)
  - Nanyang Polytechnic (NYP)
- NTU-Mentorship Programme (NTU-MP)
  - National Institute of Education (NIE/NTU)
  - School of Biological Sciences (NTU)
- NUS-Computer Mentoring Programme (NUS-CMP)
  - School of Computing, National University of Singapore (NUS)
- NUS-Engineering Mentoring Programme (NUS-EMP)
  - National University of Singapore/Faculty of Engineering (NUS)
- NUS-Science Mentorship Programme (NUS-SMP)
  - National University of Singapore/Faculty of Science (NUS)
  - National Parks Board (NPB)
- RP-Human Performance Programme (RP-HPP)
  - School of Sports, Health and Leisure, Republic Polytechnic (RP)
- RP-Science Exploration Programme (RP-SEP)
  - School of Applied Science, Republic Polytechnic (RP)
- Science Centre Mentorship Programme (SC-MP)
  - Science Centre Singapore

Selection Criteria of Programmes

All pupils who are interested in science from our selected top secondary schools are eligible to apply. Pupils will be admitted to the SMP based on the following criteria:

1. Interest in science
2. Ability to grasp abstract scientific concepts
3. Motivation and initiative
4. Time-management skills
5. Commitment and discipline
6. Intellectual curiosity
7. Ability to work with others in a team
8. Social skills needed to relate to adults
9. Recommendation by a Science Teacher
10. Recommendation by Head of Department or Principal

Structure of Programmes
The programmes comprise 2 parts:

- Mentorship Attachment/Project Work
- Youth Science Conference

Project Work

Pupils initiate and design scientific investigations under the guidance of science teachers as their mentors.

Mentorship Attachment

Mentors from the participating institutions are invited to offer projects for the programmes. Pupils who are keen to participate in the programmes select the projects that interest them.

Pupils will be exposed to the scientific process of problem solving, exploration and discovery to develop intellectual skills and curiosity that will stimulate them to evaluate and challenge information rather than be passive learners.

Pupils work on their projects 3 hours weekly from January to July and spend 2 weeks full-time during the June holidays at the tertiary institutions. Pupils write a scientific paper for publication in the Proceedings of the Youth Science Conference.

Youth Science Conference

The Youth Science Conference showcases through poster exhibits of all the projects in the programmes to an audience of peers, teachers and scientists. These projects are also judged by panels of scientists and awarded with prizes.

Roles of Mentors from participating institutions

1. Provide expert guidance, resources, support and encouragement.
2. Act as role model and coach.
3. Edit and submit pupils' work for publication and/or nomination for awards.

Roles of School Coordinator

1. Liaise with GE Branch on all matters pertaining to programmes.
2. Co-ordinate and monitor projects allocated to pupils in the respective schools.

Roles of Teacher-Advisor

1. Provide appropriate support, advice and counsel to pupils when a need arises.
2. Provide managerial assistance such as time management and time scheduling.
3. Liaise with mentors. Mediate between mentors and pupils if problems arise.
4. Monitor pupils' progress by holding regular conferencing sessions to provide feedback to them.
5. Vet drafts for scientific paper/posters for exhibition.

Roles of Gifted Education Branch Officer

1. Make available projects from mentors.
2. Allocate projects to pupil applicants.
3. Plan, organise and monitor programmes.

4. Report and account for programmes.

Roles of Institutional Co-ordinator
Participating institutions normally provide a group of mentors headed by a coordinator whose duties include:

1. Liaising with GE Branch on all matters pertaining to SMPs.
2. Briefing mentors on their duties.
3. Collating project proposals from mentors.
4. Collating scientific papers for publication in the Proceedings of the Youth Science Conference.
5. Granting approval for reimbursement to mentors or payment to suppliers.
6. Collating feedback forms.
7. Attending 2 working committee meetings a year.

SCHOOL-BASED SCIENCE MENTORSHIP PROGRAMME

Aim
This aims to cultivate in Secondary 2 & 3 pupils the spirit of inquiry as well as to develop attitudes and values for the proper conduct of science. This will help to prepare and equip them better for a mentorship experience with a scientist when they are ready.

Objectives

- To promote scientific study through investigative science projects
- To encourage the use of creative and innovative methods in problem solving
- To heighten pupils' awareness and generate interest in scientific research and technological development
- To nurture values and positive attitudes towards scientific inquiry and competitions

Target Group

Secondary 2 and 3 SBGE[1], IP[2] and selected non-GEP[3] pupils

SMP Website
Important updated information will be uploaded to be SMP website. The following website is where you could check up for these updates.

URL: http://www.moe.gov.sg/education/programmes/gifted-education-programme/special-programmes/science-programmes/science-mentorship-programmes/

[1] School-Based Gifted Education
[2] Integrated Programme
[3] Gifted Education Programme

AFFECTIVE EDUCATION VALUES

AE values	Participants must
1. Responsibility	• Behave properly in the lab. • Not cancel any prearranged sessions.
2. Commitment	• Manage his/her time between his/her participation in the SMP and his/her CCAs. • Complete the tasks assigned to him/her.
3. Perseverance	• Pursue his/her interest till completion of the research work and not give up easily when faced with difficulties.
4. Respect	• Correspond and communicate with mentor and lab technicians with due respect and appropriate protocol. • Follow the instructions and advice of the mentor and teacher-advisor. • Learn to develop good working relationship with other researchers in the laboratory.
5. Adaptability	• Learn to relate and adapt to your mentor who may have his/her idiosyncrasies. • Resolve all problems with other team members to complete the project. • Reframe your perception - How to manage difficulties/problems and frame them into learning opportunities?
6. Enthusiasm	• Demonstrate eagerness in exploring and learning more about the topics which are outside the school curriculum. • Conduct independent studies on areas of interest. • Attend talks, seminars and conferences to gain more knowledge.
7. Honesty	• Report data that is original and not falsified.
8. Integrity	• Not divulge research data or results without permission of your mentor.
9. Humanity	• Conduct research that will benefit others and community.
10. Humility	• Acknowledge the good work of others.

GENERAL GUIDELINES

1 Punctuality

Students must be punctual for appointments. Call in advance if a change of schedule is really necessary. It is courteous to explain the reason and make arrangements to reschedule the next visit within the same week. You need to give mentors sufficient advance notice of your absence so that time and effort in preparing the experiments for observation and test will not be wasted. Give your full commitment.

3 Time Card

You will have to ensure that the time card is signed by your direct supervisor after each visit. Your teacher-advisor will check your time card and your science log book at each individual conferencing session.

4 Background Information

You are expected to do a library research to gather background information for your project. Guidelines are provided on Page 9. You may attend relevant lectures given by your mentor(s) at the tertiary institution.

5 Safety in the Laboratory

You are not to work alone in any laboratory, without the prior knowledge and supervision of a staff member. You are responsible for cleaning up after each practical session in the laboratory. You must be dedicated to maintaining safe conditions in the laboratory. You must obey instructions in all aspects of the use of the equipment and materials in the laboratory. Refer to Page 11 for the details.

6 Science Data Record Book

You are to keep a record of your activities and data collected for the project. Record keeping is an essential research skill. You are to begin a science data record book on the first day of the mentorship and keep it current throughout. The following information should be included:

- Questions, Ideas
- Personal reflections
  - What aspects of your work do you find most/least interesting?
  - What personal strengths have you discovered through stretching yourself at this mentorship?
  - In what areas do you need to improve and how will you accomplish this?

For each experiment conducted:

- date
- person who conducted the experiment
- laboratory procedure & amendments
- experimental data and analysis

The science data book is to serve as a record of the actual work done by each member of the group, and the thinking behind the development of the project. This will be assessed for the final judging at the Youth Science Conference.

7 Products

a. Research paper
b. Poster Presentation

8 Writing and Publication of Research Paper

Your research paper is to be submitted first to your Teacher Advisor for vetting. Then, you will submit the vetted copy to your mentor for his/her review and editing. You will need to make the necessary amendments, based on feedback by your mentor. Once the final report has been approved by your mentor, he/she will submit it to the respective institution coordinators.

9 Presentations at Youth Science Conference

You will have to present your findings using poster presentation at the conference to an audience of students, teachers, lecturers, parents. Your teacher-advisor will inform you which category your project belongs to. Refer to guidelines provided in this Handbook.

10 Learning Plan

Design a learning plan with your mentor at the start of the mentorship programme, stating what you will learn, how you will learn it and draft your practical work schedule. Refer to the main work plan given by the Gifted Education Branch.

11 Work Plan

Remember the important dates and events of the mentorship programme. You have to participate in all the events listed on the work plan.

12 Monitoring and Counselling

Your teacher-advisor will monitor your progress weekly and offer advice and guidance to help you in the mentorship programme. Keep him/her informed of the progress of the projects, esp. the problems or difficulties or issues that need to be looked into.

At the weekly meeting with your teacher-advisors, you are to update your progress briefly using the *Progress Review Form*. This will be submitted to GEB for monitoring.

13 On Completion of Project

You will be awarded a Certificate of Completion on completing the project and the research paper. Do not forget to show in a tangible way your appreciation for the help and guidance you have received from your mentor(s) and/or lab technicians. Do remember to make a copy of whatever product, CD-ROM, etc. for your mentor.

14 Evaluation

At the end of the mentorship programme your mentor and teacher-advisor will evaluate your participation in the programme. You will also complete an online feedback form on the mentorship programme. Details will be provided later.

The key for a successful mentoring relationship is to keep the communication going and respect the commitments agreed by both parties.

LITERATURE REVIEW

Why do Literature Review?

There are good reasons for spending time and effort on a review of the literature before embarking on a research project. These reasons include:

- to identify gaps in the literature
- to avoid reinventing the wheel (at the very least this will save time and it can stop you from making the same mistakes as others)
- to carry on from where others have already reached (reviewing the field allows you to build on the platform of existing knowledge and ideas)
- to identify other people working in the same fields (a researcher network is a valuable resource)
- to increase your breadth of knowledge of your subject area
- to identify seminal works in your area, ie. those with potential for development
- to provide the intellectual context for your own work, enabling you to position your project relative to other work
- to identify opposing views
- to put your work into perspective
- to demonstrate that you can access previous work in an area
- to identify information and ideas that may be relevant to your project
- to identify methods that could be relevant to your project

Questions to Guide You

As far as possible, read so as to seek a better understanding to the following questions:

1. What is the history of this specific area of science?
    - Who were the scientists involved?
    - What questions did they try to answer?
    - What central questions remain unanswered?

2. Who are the current scientists who are well-known in the area?
    - How is their work relevant to yours?

3. What concepts are central to this area?
    - What concepts do you need to understand in your project?

4. What methods are commonly used in this area and in your project?

5. Are there any controversial issues involved that scientists are not able to resolve currently?

Resources Available

- Internet articles
- Magazines
- Journals
- Books; Textbooks
- Encyclopaedias
- Dictionaries

How to Evaluate Resources

It is always important to consider the accuracy and quality of the information you use, irrespective of its format. It is especially important to critically evaluate electronic resources as there is no quality control on the Internet and it is essential to verify the authenticity and accuracy of sites.

Some questions to ask when evaluating Internet sites are:

Author	• Can you easily identify the author of the Web page or site? • Does the author give their affiliations, credentials or reason for publishing the information?
Type of Information	• Look at the URL or address. Where did the document originate? Is the information scholarly, governmental, from a private business or association, or an advertisement? • Do other reputable Internet sites point to this one?
Purpose	• Is the author making an argument for personal gain, offering an opinion, giving a factual report or relaying a personal observation? • For whom is the site intended?
Sources	• Is the information from original research, experiments, observation, interviews, books or documents? • Are references provided?
Timeliness	• When was the material published? • Has the content been updated recently?

The following website gives more information on how to critically analyze information sources:
http://www.library.cornell.edu/okuref/research/skill26.htm

The Literature Review (Deakin University Library)
URL: http://www.deakin.edu.au/library/findout/research/litrev.php

SAFETY GUIDELINES FOR SCIENCE LABORATORIES

The laboratory staff will be conducting a thorough briefing regarding safety guidelines and measures for the respective institution laboratories. Ensure that you comply with them for your own safety.

General Guidelines

- Be aware of poisonous and flammable substances.
- Be familiar with location and use of safety equipment, such as fire extinguisher, fire blanket, eyewash, etc.
- Have an understanding of the potential hazards of all materials, processes and equipment that will be used.
- Do not work alone in any laboratory and working without prior knowledge of a staff member.
- When conducting experiments with hazards or potential hazards, ask yourself these questions:
  - What are the hazards?
  - What are the worst possible things that could go wrong?
  - How will I deal with them?
  - What are the prudent practices, protective facilities and equipment necessary to minimize the risk of exposure to the hazards?
- Report all accidents (incidents), no matter how small.
- Clarify the procedure for disposal of hazardous waste.
- Clarify how you should get help when an accident or injury occurs (panic button, telephone, message system, student runner, etc.).

GUIDELINES FOR RESEARCH PAPER FOR PUBLICATION IN YSC PROCEEDINGS

1. Each project paper should keep to a minimum of 5 pages of text exclusive of diagrams, tables and graphs. However, each paper should not exceed 9 pages inclusive of diagrams, tables and graphs. It should be laser printed on good quality **A4 sized paper with single line spacing and 1 inch margins** throughout.
   Font type: **Times New Roman**. Font size: **13 points and bold** for the title and **12 points** for the text.

2. Papers that do not conform to this standard will not be accepted.

3. Students must submit the final version, both the hard and soft copy (Microsoft Word) of their papers to mentors by **22 July (Friday)**. Papers that are received late will not be published in the Proceedings of the Conference.

4. The paper should be in the following format:

   i. **Title**: This should be brief (not exceeding two lines) and precise. It should be typed in **bold capital letters**. Font type: **Times New Roman**. Font size: **13 points**,

   ii. **Name(s) of Author(s)**: Family name should be underlined. Mentor's name should be mentioned last (without titles). Font type: **Times New Roman**. Font size: **10 points.**

   iii. **Affiliation(s) of Author(s)**: To be spelt out in full. Font type: **Times New Roman**. Font size: **10 points.**

   iv. **Text:** The rest of the text should follow the font type **Times New Roman** in font size **12 points**.

   Example

> **EXTRACTION AND CHARACTERISATION OF PIGMENTS FROM MICROALGAE**
>
> Yeo Yaw Shin [1] and Chang Yoon Ching [2]
>
> [1] Raffles Institution, Raffles Institution Lane, Singapore 575954
> [2] Centre for Life Sciences & Chemical Engineering, NgeeAnn Polytechnic, 535 Clementi Rd, Singapore 599489
>
> **ABSTRACT**
>
> .....
> .....
> .....

   v. **Abstract**: This should be a brief and informative summary of the main findings of the paper. It should not exceed 200 words.

   vi. **Math formulae/equations:** To be typed out using Equation Editor in Microsoft Word.

   vii. **Introduction**: This should be clear and include the purpose of the work.

viii. **Materials and Methods**: Experimental details should be concise but sufficient to allow a qualified operator to repeat the work. Refer to previously published procedures employed by citing the paper. Do not include extensive details unless they present substantially new modifications.

ix. **Results**: This may be presented in text, tables, figures or photographs. Figures, photographs and tables should be placed in the appropriate place where they are first cited in the text and they must have clear headings (**Table 1**, **Table 2**, **Figure 1**, **Figure 2** etc.). Only originals must be submitted and unless they are biological drawings, they should not be hand drawn. Students are advised to use computer software programmes for plotting graphs.

(A) The caption of any table of results should be presented as shown.

Table 3: Set up of 5 different experiments and their physical observations

Expt	Soya milk	Cow's milk	Incubation Temp	Time	Physical appearance of Curds formed
1	Drinho	Dutch Lady	Room Temperature 28^{o}C	2 days (40 hrs)	All samples turned into curd / coagulated and the strength of the curds. Curds were weakened on further incubation.
2	Sobe soya milk	Dutch Lady	Room Temperature 28^{o}C	1 day (20 hrs)	All samples turned into curd / coagulated but the curds were too lumpy, probably due to the high protein content in Sobe soya milk.
3	Drinho	Dutch Lady	Room Temperature 28^{o}C	1 day (20 hrs)	All samples turned into curd and yoghurts with high % of soya milk had a coarser texture
4	Drinho	Dutch Lady	37^{o}C	1 day (20 hrs)	All samples turned into curd and there was curd separation at high % of soya milk substitution.
5	Drinho	Dutch Lady	43^{o}C for 4 hours and 28^{o}C overnight	1 day (20 hrs)	All samples turned smooth curds, appearance quite close to the commercial products.

(B) The caption of any figures, graphs and photographs should be presented as shown below.

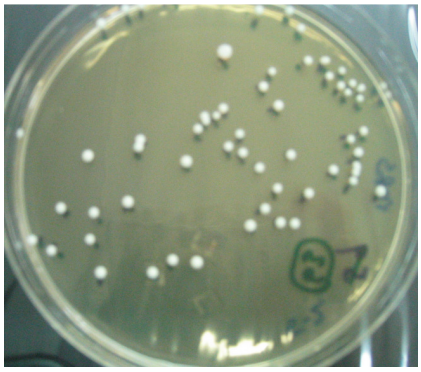


Figure 2: A typical dilution plate with well isolated colonies

Figures, photographs and graphs will not be printed in colours, unless really necessary.

x. **Discussion**: This should be concise and deal with interpretation of results.

xi. **Acknowledgements**: Remember to acknowledge all those who have helped you in this project.

xii. **References**: Reference citation should be numbered sequentially as they appear in the text ([1], [2], etc.), followed by those in tables and finally by those in figure legends. Only published papers are numbered and included in the Reference section. All other forms of reference, including unrefereed abstracts, should be cited in the text as personal communications, manuscript submitted or in preparation.

The Reference list should contain only author(s)'s name(s), year, title of paper, journal title and the first and last page numbers. Reference to books should include editor(s)'s name(s), publisher and place.

Example:

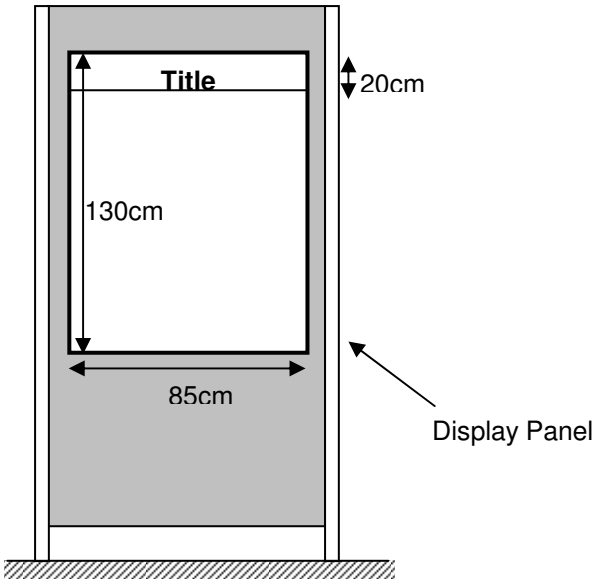
REFERENCES

[1] Bowers, L. D. 1986. Applications of immobilised biocatalysts in chemical analysis. Analytical Chemistry 58: 513-515.

[2] Mouras, A., Hinnidaels, S., Taylor, C. and Armstrong, K. C. 1991. Localisation of transferred genes in genetically modified plants, p159-166. In: Advanced methods in plant breeding and biotechnology. Murray, D. R. (ed.) C. A. B. Intl., U. K.

GUIDELINES FOR PREPARATION OF POSTER EXHIBITS AT YOUTH SCIENCE CONFERENCE

1. All participants are required to present their research findings on a mounting board of dimension 85 cm (width) x 130 cm (height),inclusive of the title; Orientation: Portrait. Velcro tapes for mounting the posters will be provided by GE Branch.



2. **Title** of project: should be brief, informative and readable from 2 or 3 metres away.

3. **Headings** should include purpose, hypothesis, procedure, results and conclusion.

4. **Text**: keep the text to a minimum; be clear and concise.

5. **Tables**, **Diagrams** and **Photographs**: keep simple; use colours effectively; legends and labels should be easy to read. Only originals are accepted.

6. Mount your poster according to poster number on the board. (You will be given your poster number on the judging day)

Poster Judging

7. Mounting time: **8.00 am** on **9 September 2011** at **Nanyang Auditorium, NTU**

8. Poster Judging begins at **9.00 am** on **9 September 2011**.

9. Structure: (Total 15 mins)
   - Brief 5 mins summary of your project
   - Q & A Session by Judges (approx. 10 mins)

10. Criteria for Judging:

A. Scientific or Mathematical Thought/Engineering Goals (50 %)

I. Scientific/Mathematical Thought

1. Is the problem stated clearly and unambiguously?
2. Was the problem sufficiently limited to allow a plausible approach? (Good scientists can identify important problems capable of solutions)
3. Was there a procedural plan for obtaining a solution?
4. Are the variables clearly recognized and defined?
5. If controls were necessary, did the students recognize their need and were they correctly used?
6. Are there adequate data to support the conclusions?
7. Does the student / team recognize the data's limitations?
8. Does the student / team understand the project's ties to related research?
9. Does the student / team have an idea of what further research is warranted?
10. Did the student / team cite scientific literature, or only popular literature (local newspapers, Reader's Digest).

II. Engineering Goals

1. Does the project have a clear objective?
2. Is the objective relevant to the potential user's needs?
3. Is the solution workable, acceptable to the potential user, economically feasible?
4. Could the solution be utilized successfully in design or construction of an end product?
5. Is the solution a significant improvement over previous alternatives?
6. Has the solution been tested for performance under the conditions of use?

B. Thoroughness (20 %)

1. Was a Project Log Book kept throughout duration of the project? Is it well-documented?
2. Was the purpose carried out to completion within the scope of the original intent?
3. How completely was the problem covered?
4. Are the conclusions based on a single experiment or replication?
5. How complete are the project notes?
6. Is the student / team aware of other approaches or theories?
7. How much time did the student / team spend on the project?
8. Is the student / team familiar with scientific literature in the studied field?

C. Clarity (20 %)

1. How clearly does the student discuss the project and explain the purpose, procedure, and conclusions? (Watch out for memorized speeches that reflect little understanding of principles)
2. Does the written material reflect the student's or team's understanding of the research?
3. Are the important phases of the project presented in an orderly manner?
4. How clearly are the data & results presented?
5. How well does the project display explain the project?
6. Was the presentation done in a forthright manner, without tricks or gadgets?

D. Teamwork (10 %)

1. Are the tasks and contributions of each team member clearly outlined?
2. Was each team member fully involved with the project, and is each member familiar with all aspects?
3. Does the final work reflect the coordinated efforts of all team members?

Adapted from: Judging Guidelines – INTEL ISEF
URL: http://www.sciserv.org/isef/judges/judges_guidelines.asp

11. Dismounting time: **After the announcement of results on the same day**

At Youth Science Conference on 17 September 2011

12. Mounting time: **7.15 am** on **17 September 2011** at **Nanyang Auditorium, NTU.**

13. Be at your poster exhibit to explain your project during viewing session.

14. Remove your poster as soon as the session ends or by 1 pm.

SCIENCE MENTORSHIP PROGRAMMES 2011
RESEARCH PLAN

Instruction to Participants:

1. Discuss with your mentor the planning and implementation issues of your project before completing this form.
2. Submit the completed form to your mentor, teacher-advisor, and School-coordinator by **25 February 2011**.
3. This form can be downloaded at www.moe.gov.sg/education/programmes/gifted-education-programme/special-programmes/science-programmes/science-mentorship-programmes/

STUDENT NAME(S)	**SCHOOL/TEAM**
MENTOR	**PROGRAMME/INSTITUTION**

TITLE OF PROJECT			
CATEGORY (Tick appropriate category)	☐ Chemistry ☐ Biochemistry ☐ Botany ☐ Microbiology ☐ Zoology	☐ Environmental Science ☐ Medicine & Health ☐ DNA Science ☐ Space Science	☐ Computer Science ☐ Physics ☐ Mathematics ☐ Engineering: (Specify which area of engineering) _____ ☐ Others: _____
PURPOSE OF RESEARCH (including Hypothesis/Problem/Engineering Goals)			
SCOPE OF RESEARCH			

METHODOLOGY
(Details of Procedures, Method, Data Analysis, Bibliography)

RISK ASSESSMENT

1. **List/identify the hazardous chemicals, activities, or devices that will be used**

2. **Identify and assess the risks involved.**

3. **Describe the safety precautions and procedures that will be used to reduce the risks.**

4. **Describe the disposal procedures that will be used (when applicable).**

5. **List the source(s) of safety information.**

DESIRED OUTCOMES/SKILL ACQUISATION

PROPOSED TIMELINE
Using the template provided, think through and discuss with your mentor the planning and implementation issues of your project in creating a reasonable timeline to guide the progress and completion of your project. Provide sufficient time for the various phases of your research, e.g. literature review, experimentation, review, writing of research paper, presentation preparation. Take into consideration your school commitments and the timeline for SMP as reflected in your handbook.

Phase	Task	Date/Duration

Progress Review & Report of Participants on Science Mentorship Programmes

Teacher-Advisor: _____ School: _____ Date _____

Name of Programme: _____

SMP participants are required to use this form to record their research progress <u>weekly</u>. This form may be downloaded at
http://www.moe.gov.sg/education/programmes/gifted-education-programme/special-programmes/science-programmes/science-mentorship-programmes/

Project Title / Participants	**Date**	**Work Done** (such as work pertaining to literature review, laboratory work, writing research paper and etc)
Title: Mentor:		
Mentees		
Institution:		

Date	Work Done

Date	Work Done

Are you satisfied with the progress of the project?

Problems Encountered: ***(Please highlight those you need the Branch to look into)***

SMP School Coordinators: *Please collate and return forms by mail or fax (68354465) to the following officers by* ***27 May 2011 (Friday)****. If your students are having problems, please give details so that we can assist you. Thank you.*
Mr Andy Shi (andy_shi@moe.gov.sg), Mr Samuel Lee (lee_tzi_yew@moe.gov.sg), Mr Goh Shu Liang (goh_shu_liang@moe.gov.sg) and Ms Tan Hui Zhen (tan_hui_zhen@moe.gov.sg).

PROCEDURE FOR CLAIMS AND PAYMENT

With effect from January 2005, all payment by the Singapore Government will be made by electronic fund transfer only.

REIMBURSEMENT TO MENTORS

1. If you do not have a GIRO account with the Singapore Government, you would need to fill in **DCA Form 6** to have the payment directed to your designated bank account. Send the completed form by post, together with a photocopy of your bankbook/card, to the designated address of GEB. (This only needs to be done once.)

2. At the end of the project, fill in **SMP Claim Form A** for all items for which you are seeking reimbursement. Hand in the completed form to your institution programme co-ordinator, together with all original receipts, for endorsement.

3. All the form(s), together with the necessary attachments, are to be sent to :

   Mr Andy Shi
   Gifted Education Branch
   51 Grange Road
   Block 1, #01-09
   Singapore 249564

The following forms may be downloaded at the SMP website
(http://www.moe.gov.sg/education/programmes/gifted-education-programme/special-programmes/science-programmes/science-mentorship-programmes/info-for-mentors/):

- **DCA Form 6**
  - **Direct Credit Authorisation for Mentors**
    This form is for use by INDIVIDUALS to have payments due to them, credited direct to their designated bank account.
  - **Direct Credit Authorisation for Businesses & Companies**
    This form must be completed by BUSINESSES OR COMPANIES to have payments due to them for goods supplied or services rendered to the Government credited direct to their designated bank accounts.
- **SMP Claim Form A – For Reimbursement to Mentor**

PAYMENT TO SUPPLIERS

1. If the company/supplier does not have a GIRO account with the Singapore Government, the supplier will need to use **DCA Form 6** to have the payment directed to its designated bank account. For instruction to fill up the DCA Form 6, please refer to **DCA Form 5**.

2. The supplier will have to obtain their banker's certification for Part II of the form. All the form(s), together with the necessary attachments, are to be sent to :

   Mr Andy Shi
   Gifted Education Branch
   51 Grange Road
   Block 1, #01-09
   Singapore 249564

   The completed DCA Form 5 is to be sent to the designated GEB officer and address. (This only needs to be done once.)

3. With effect from 1 Nov 2008, all suppliers billing the Government Ministries are required to submit their invoices electronically online via Vendors@Gov portal (www.vendors.gov.sg). This is set out as part of the Government's procurement terms and conditions in the Government Electronic Business (GeBIZ) system. When advising suppliers to raised e-invoice to Gifted Education Branch via the portal, please inform them that the sub-Business Units for Gifted Education Branch, Education Programmes Division is **MOE20**.

4. Seek approval from your institutional coordinator via email, stating clearly the Project Code of the project which you are mentoring, before getting suppliers to submit e-invoice to Gifted Education Branch.

5. Institutional coordinators are required to confirm the delivery of the goods/services with Mr Andy Shi (Andy_SHI@moe.gov.sg) from Gifted Education Branch via email. The email should also include the **description of goods/services delivered** and the **Project Code** of the project for which the purchase is made for. The email will serves as a form of verification when the finance department make payment to the suppliers. Please note that the budget for each SMP project is $500.

DCA FORM 5

APPLICATION FORM FOR INTERBANK GIRO
(Only Original Form is acceptable.)

This form may take you 10 minutes to fill in.
You will need the following information to fill in the form:
- **The supplier's registration number (i.e. ACRA no., NRIC no., FIN No. or Society no.)**
- **The supplier's bank account details**

EXPLANATION ON HOW TO FILL IN THE INTERBANK GIRO FORM

(A) Important Points to Note to Ensure Prompt Payments:

(i) If you are
(a) **not** a Company or Business registered with ACRA or
(b) **not** a Singapore Citizen / Singapore Work Permit Holder ,
please get your banker's endorsement in Part III. This applies even if your banker is DBS, POSB, OCBC, UOB, Far Eastern Bank (FEB) or Citibank.

(ii) For **new supplier** who wishes to receive payments from the Government by direct credit into the designated bank account, please mail the ENTIRE original form to the requesting Ministry/Department.

(iii) For **existing supplier** who wishes to change existing bank account number so that all future payments from the Government will be credited to the new bank account, please mail the ENTIRE original form to **Accountant-General's Department, 100 High Street, #06-01 The Treasury, Singapore 179434**.

(iii) For corporate vendors, you can update changes in contact information such as telephone number, fax number or email address via AGD Vendors@Gov webpage at http://www.vendors.gov.sg

(B) General Information

(i) For a Company, Business or Limited Liability Partnership registered with ACRA, you can obtain your ACRA registration number **and** ACRA registered name via ACRA website (www.acra.gov.sg) under the "*Online Directory Companies / Business / Accountants*". Select "*Directory of Companies / Business Names*" before entering your ACRA registration number or ACRA registered name.

(ii) For an Individual, please ensure that you fill up your name **exactly as stated in your NRIC**.

(iii) For Societies, please fill in your Society's registration number as provided by MHA / MCYS.

DCA FORM 6

APPLICATION FORM FOR INTERBANK GIRO

(Only Original Form is acceptable.)

Note: No correction tape/fluid should be used on this form. Any cancellations made must be endorsed by the supplier/bank.

Part I (TO BE COMPLETED BY REQUESTING MINISTRY / DEPARTMENT)

Name of Ministry/Department	MOE/GEB	Contact Officer	Sharifa Nur Yacoob
Telephone Number	6 8 3 1 9 6 3 7	Fax Number	6 8 3 5 4 4 6 5

Please tick one of the relevant boxes:

Approval of new vendor record ☐ Update of existing vendor record ☐ Vendor ID

Part II (TO BE COMPLETED BY SUPPLIER WHO SUPPLIES GOODS AND SERVICES TO THE GOVERNMENT)

To: ACCOUNTANT-GENERAL

Bank Account to be credited

Name(s) of Bank Account Holder(s)

Bank No	Branch No	Account No

Bank and Branch Name

ACRA No. (for companies)		NRIC No. (for individuals)	
Address		Others (eg. Foreign Passport No., Society No.)	
		GST Registered: ~~Yes~~ / No	
Telephone Number		Email Address	(Note: Remittance Advice will be sent to the email address given)
Fax Number			

(a) I/We hereby authorise the Government to credit payments due to me/us to the above account. Amounts so credited would constitute valid discharge of obligations due to me/us.

(b) This authorisation shall continue to be in force until I/we have notified you in writing.

(c) I/We hereby request and authorise The Government of Singapore to obtain confirmation/verification of information relating to me/us and/or to my/our account(s) from/with the bank where the Account is maintained as stated in the form.

(d) In consideration of the Government acceding to my/our said request and in consideration the Bank confirming/verifying such information pursuant to the said request, I/we irrevocably consent to and authorise the Bank, including any officer thereof, to disclose any information whatsoever relating to me/us and to the Account as is necessary for the sole purpose of account validation and agree that such authorisation shall survive any termination of the Account. I/We agree that this consent shall survive the termination of any of the Account with the Bank and may be relied on and enforced as fully and effectively by the Bank as if it is addressed to the Bank.

(e) I hereby consent/do not consent*(please delete accordingly) to the release of my updated address by the Immigration and Checkpoints Authority (ICA) to the Accountant-General's Department for the purpose of sending the Remittance Advice to me.

Date _____ Authorised Signature(s) and stamp as in bank's record _____

Part III (FOR SUPPLIER TO GET BANK ENDORSEMENT IF SUPPLIER IS

I) NOT A COMPANY OR BUSINESS REGISTERED WITH ACRA;

II) NOT A SINGPORE CITIZEN / SINGAPORE WORK PERMIT HOLDER ; OR

III) SUPPLIER'S BANKER IS NOT DBS, POSB, OCBC, UOB, Far Eastern Bank (FEB) or Citibank

To: ACCOUNTANT-GENERAL

We hereby certify that the signature(s)/other particulars as stated in Part II agree(s) with that contained in our files.

Name & Signature of Authorised Bank Officer _____ Date/Official Stamp _____

SAMPLE

This form can be downloaded at http://www.moe.gov.sg/education/programmes/gifted-education-programme/special-programmes/science-programmes/science-mentorship-programmes/

APPLIED SCIENCE PROGRAMME

REQUEST FOR REIMBURSEMENT TO MENTOR

DATE	INVOICE NO.	DESCRIPTION OF ITEM PURCHASED	AMOUNT ($)
		TOTAL	

I certify that the item(s) has / have been received and paid by me.

Name of Mentor (*as in bank account*) :_____

Signature: _____

Department: _____ Tel. : _____

NRIC No. : _____

Email: _____

Date: _____

.....

I confirm that the above expenditure is correct. Please reimburse the mentor.

Signature: _____ Date: _____

Mrs Koh Siok Im
ASP Co-ordinator
School of Life Sciences & Chemical Technology
Singapore Polytechnic,
500 Dover Road,
Singapore 139651

Send completed form to ***Mr Andy Shi, Gifted Education Branch, 51 Grange Road, Block 1, #01-09, Singapore 249564***

CONTACTS OF INSTITUTION COORDINATORS

	Institution	Co-ordinator
1	DSTA and DSO National Laboratories (DSP)	**Ms Cindy Zhang** Defence Science & Technology Agency (DSTA) 71 Science Park Drive Singapore 118253 Tel: 6879 5109 Fax: 6872 1315 Email: ZMElQI@dsta.gov.sg **Ms Agnes Chia** Executive, Outreach Department DSO National Laboratories (DSO) 20 Science Park Drive Singapore 118230 Tel: 6796 8272 Fax: 6774 6130 Email: clihwa@dso.org.sg
2	Institute for Infocomm Research	**Dr Manjeet Singh** Senior Research Fellow 1 Fusionopolis Way #21-01 Connexis (South Tower) Singapore 138632 Tel: 6408 2465 Email: singhm@i2r.a-star.edu.sg
3	Nanyang Polytechnic (NEST)	**Mr Richard Khaw** Manager/Projects School of Chemical and Life Sciences Nanyang Polytechnic 180 Ang Mo Kio Ave 8 Singapore 569830 Tel: 6550 1523 (O) Fax: 6552 0844 Email: richard_khaw@nyp.edu.sg
4	Ngee Ann Polytechnic (BP)	**Dr Hedy Goh** Deputy Director School of Life Sciences & Chemical Technology NgeeAnn Polytechnic 535 Clementi Road Singapore 599489 Tel: 6460 6920 (O) Fax: 6467 9109 Email: Hedy_Goh@np.edu.sg

	Institution	Co-ordinator
5	Nanyang Technological University (NTU-MP)	**Ms Yennie Kadarusman** Manager, Research Support Office Nanyang Technological University Block N2.1, #B4-01, 76 Nanyang Drive, Singapore 637331 Tel : 6316 8807 Email: YKadarusman@ntu.edu.sg
6	NIE/NTU (NTU-MP)	**Assoc Prof Chia Tet Fatt** Natural Sciences and Science Education Academic Group National Institute of Education Nanyang Technological University 1 Nanyang Walk Singapore 637616 Tel: 6790 3812 Fax: 6896 9414 Email: tetfatt.chia@nie.edu.sg **General Office** Location: Block 7 (Science), Room NIE7-03-106A
7	NUS (NUS-CMP)	**Assoc Prof Lee Mong Li** Assistant Dean School of Computing National University of Singapore Computing 1 13 Computing Drive Singapore 117417 Tel: 6516 2905 Fax: 6779 4580 Email: leeml@comp.nus.edu.sg
8	NUS (NUS-EMP)	Faculty of Engineering, NUS External Relations Office Block EA #03-15 9 Engineering Drive 1 Singapore 117576 Fax: 6779 5594 **Prof Victor Shim** Vice-Dean, External Relations Tel: 6516 2166 Email: engspwv@nus.edu.sg **Assoc Prof Tong Yen Wah** Assistant Dean, External Relations Tel: 6516 8467 Email: chetyw@nus.edu.sg **Ms Siti Raudhah Binte Mohd Has** Senior Executive Tel: 6516 8852 Email: engsrmh@nus.edu.sg

	Institution	Co-ordinator
9	NUS (NUS-SMP)	Faculty of Science, National University of Singapore Dean's Office S16, Level 9, 6 Science Drive 2 Singapore 117546 Fax: 6777 4279 **Assoc Prof Chin Wee Shong** Vice Dean, Faculty of Science Tel: 65163334 Email: scicws@nus.edu.sg **Assoc Prof Sow Chorng Haur** Assistant Dean, Faculty of Science Tel: 65163096 Email: scisowch@nus.edu.sg **Mr See Sin Hon** Asst Manager Tel :65167983 Email: scissh@nus.edu.sg **Mr Zhang Jinfeng** Executive Tel: 66011725 Email: scizj@nus.edu.sg **Ms Elene Loo** Tel: 6516 8750 Email: scilooe@nus.edu.sg
10	School of Applied Science, Republic Polytechnic (RP-SEP)	**Dr Girija** Assistant Director (Academic) School of Applied Science 9 Woodlands Ave 9 Singapore 738964 Tel: 31001039, 94510312 (O) Email: Girija@rp.sg
11	School of Sports, Health and Leisure, Republic Polytechnic (RP-HPP)	**Dr Michael Koh** Senior Director Office of Academic Services & Director School of Sports, Health and Leisure 9 Woodlands Ave 9 Tel: 9459 3107 Email: koh_teik_hin@rp.sg **Ms Genevieve Phua** Senior Academic Staff School of Sports, Health and Leisure 9 Woodlands Ave 9 Singapore 738964 Tel: 3100 0970 Email: Genevieve_Phua @rp.sg

	Institution	Co-ordinator
12	Singapore Polytechnic (ASP)	**Mrs Koh Siok Im** Section Head, Medical Biotech School of Chemical & Life Sciences Singapore Polytechnic 500 Dover Road Singapore 139651 Tel: 6772 1161 (O) Fax: 6772 1976 Email: silk@sp.edu.sg
13	Science Centre Singapore	**Mrs Anne Dhanaraj** Acting Senior Director (Education Programmes) Science Centre Singapore 15 Science Centre Road Singapore 609081 Tel: 6425 2764 Email: a_dhanaraj@science.edu.sg

CONTACTS OF SCHOOL COORDINATORS

	School	Co-ordinator
1	Anderson Secondary School	**Mdm Tey Chin Chin** Tel : 6459 8303 ext 309 tey_chin_chin@moe.edu.sg
2	Anglo-Chinese School (Independent)	**Ms Colleen Ng** Tel: 6870 0613 Fax: 6773 1433 colleen@acsindep.edu.sg **Mrs Usha Penninal Ravi Udayakumar** Tel: 6870 0486 usha@acsindep.edu.sg **Mrs Choy Hoay Min** Tel: 6870 0682 hoaymin@acsindep.edu.sg
3	Catholic High School (Secondary)	**Mr Jeffrey Goh** Tel: 6458 2177 goh_joo_leng_jeffrey@moe.edu.sg
4	Cedar Girls' Secondary School	**Leng Chengda Gabriel** Tel 6288 4909 Ext 369 leng_chengda_gabriel@moe.edu.sg
5	Chung Cheng High School(Main)	**Miss Teo Choon Mei** Tel: 6344 1393 teo_choon_mei@moe.edu.sg
6	CHIJ St Nicholas Girls' School	**Mr Paul Nah** Tel: 63541839 ext 135 nah_soon_heng_paul@moe.edu.sg
7	Commonwealth Sec School	**Mdm Low Bee Yen** Tel: 6560 6866 low.beeyen@commonwealthsec.moe.edu.sg
8	Crescent Girls' School	**Mr Lee Jianwei** Tel: 6475 3084 JIANWEILEE@crescent.edu.sg
9	Dunman High School	**Mrs Shu Yuen** Tel: 6345 0533 ext 114 shu.yuen@dhs.sg **Mrs Serene Chu** lam.nonhar.serene@dhs.sg **Mr Nigel Koh** koh.weetat.nigel@dhs.sg

	School	Co-ordinator
10	Hwa Chong Institution	**Mr Chia Kok Pin** 6465 1077 chiakp@hc.edu.sg
11	Methodist Girls' School	**Mrs Lam Mei Kien** Tel: 6469 4800 ext 560 lai_mei_kien@moe.edu.sg
12	Nanyang Girls' High School	**Mr Mark Shone** Tel: 6506 7218 mark@nygh.moe.edu.sg **Mr Benny Koh** Tel : 6506 7217 benny@nygh.moe.edu.sg **Mrs Susan Chew** Tel: 6506 7105 Fax: 6466 7564 susan@nygh.moe.edu.sg
13	National Junior College	**Mr Adrian Loh Sin Loy** Tel: 6466 1144 adrian_loh_sin_loy@moe.edu.sg **Mr Nah Hong Leong** Tel: 6466 1144 nah_hong_leong@moe.edu.sg
14	NUS High School for Mathematics and Science	**Ms Wong Pui Hong** Tel: 6516 7063 nhswph@nus.edu.sg **Ms Chua Hooi Ling** Tel: 6511 1286 nhschl@nus.edu.sg
15	Presbyterian High School	**Mrs Choy Hui Peng** Tel: 6454 3722 heng_hui_peng@moe.edu.sg
16	Raffles Girls' School (Secondary)	**Miss Goh Hui Lian** Tel: 6838 7861 huilian.goh@rgs.edu.sg **Mrs Low Hwee Tiang** Tel: 6838 7862 htning@rgs.edu.sg

	School	Co-ordinator
17	Raffles Institution	**Mr Chan Chee Kiong** Tel: 6354 9132 cheekiong.chan@ri.edu.sg **Ms Huang Yuting** Tel: 6354 9130. yuting.huang@ri.edu.sg
18	River Valley High School	**Chow Ban Hoe** Tel: 6567 8115 chow_ban_hoe@moe.edu.sg **Pan Qiuzhu Sandy (Ms)** Tel: 6567 8115 pan_qiuzhu@moe.edu.sg
19	Singapore Chinese Girls' School	**Mrs Yeo Siew Li** Tel: 6252 7605 seow_siew_li@moe.edu.sg **Miss Teo Hwee** teo_hwee@moe.edu.sg
20	St. Joseph Institution	**Ms Tan Sia Hui** Tel : 6250 0022 siahui@sji.edu.sg
21	Temasek Junior College	**Mr Tan Seng Kwang** Tel: 6442 8066 ext 147 tan_seng_kwang@tjc.edu.sg
22	Victoria Junior College	**Ms Chua Sze Yi Kerin** Tel: 6240 2135 chua.szeyi@vjc.sg
23	Victoria School	**Mrs Felicia Yeo Chiou Ming** Tel: 6291 2965 (ext 264) yeo_chiou_ming@moe.edu.sg

GEB/MOE COORDINATORS

1 **Mr Andy Shi Jinghao**
Tel. 6831 9589
Fax. 6835 4465
Andy_SHI@moe.gov.sg

2 **Miss Phuan Siew Khoon**
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3 **Mr Goh Shu Liang**
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4 **Ms Tan Hui Zhen**
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5 **Mr Samuel Lee Tzi Yew**
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Fax. 6835 4465
lee_tzi_yew@moe.gov.sg

GUIDELINES FOR SCHOOL COORDINATORS

A. SMP APPLICATION FOR 2012

Procedure for Pupils

1. Pupils who are keen to participate in SMP 2012 are to register at the SMP portal. Login accounts will be issued to schools by GEB officers.

2. Pupils have to check on the outcome of their applications at the SMP portal after the deadline for release of results.

3. Successful applicants would be required to select/propose their projects once they have been accepted into SMPs. Instructions are posted at the SMP website.

Procedure for School Coordinators

1. Check that **pupil applicants do not have CCAs involvement > 3 times a week.** (This is especially important as the laboratories in our partner agencies are not likely to be open on weekends due to the 5-day work week of the lab staff. The main complaint from mentors has always been that our pupils are often too involved in their CCAs to have sufficient time for their projects.)

   If they do, you would need to talk to them to discuss the adjustments they have to make to cater for a week day in SMPs. They would then need to attach a written plan to their application form to show the adjustments to be made, the concessions given by their CCA teachers-in-charge, etc.

2. Ensure that the pupils are ready academically, socially and emotionally for work with an external mentor.

3. If you have really outstanding students with potential for advanced work, put in a strong recommendation for them in the application forms to enable GEB to identify them.

4. Group your pupils into suitable groupings, after eliminating those who are not suitable.

5. Forms of pupils in the same group should be stapled together and submitted to GEB.

6. SMP 2011 participants may participate in SMP 2012. However, please note that they will be given second priority when allocating projects proposed by the institutional mentors.

7. Do not submit applications which are not supported by you/HOD.

8. Ensure that the pupils who are not approved by the school are informed accordingly.

B. INCLUSION OF SCHOOL-SOURCED PROJECTS IN SMP

For New Institutions/Institutions in SMP

1. Inform GEB of potential project.
2. Brief the mentor on the structure of SMP, using the SMP website (http://www.moe.gov.sg/education/programmes/gifted-education-programme/special-programmes/science-programmes/science-mentorship-programmes/):
   - Time frame of commitment: Jan - September
   - Nature of commitment
   - Role of a mentor
   - Participation in Youth Science Conference & SSEF
3. Obtain mentor's consent to be included in SMP via email, keeping GE Branch in the loop.
4. Inform GE Branch details of the project, mentor, teacher-advisor and pupils for follow-up.

SINGAPORE SCIENCE & ENGINEERING FAIR 2012

1 The projects under SMPs are eligible to be submitted to the *Singapore Science and Engineering Fair (SSEF)* held the following year, which is affiliated to the international *Intel Science and Engineering Fair* (ISEF).

The Singapore Science & Engineering Fair (SSEF) is a national competition held in March organised by the Ministry of Education (MOE), the Agency for Science, Technology & Research (A*STAR) and the Singapore Science Centre (SSC). The SSEF is affiliated to the prestigious Intel International Science and Engineering Fair (Intel ISEF), which is regarded as the Olympics of science competitions.

After the YSC this year, students and mentors may want to extend the project beyond the scope of SMPs to continue work till December, and submit the project for SSEF 2012.

2 SMPs mentors, pupil participants and schools who are interested in participating in SSEF need to ensure that all the rules and regulations are complied with. **All the necessary forms are to be filled in before the commencement of the projects.**

The following table shows the list of forms that should be submitted. These forms and regulations are compiled for your reference at the back of this handbook.

Form	Description
Checklist for Adult Sponsor/ Safety Assessment Form (1)	Required for **all** projects!
Research Plan Attachment and Research Plan (1A) - Individual Project	Required for **all** individual projects!
Research Plan Attachment and Research Plan (1A) - Team Project	Required for **all** team projects!
Approval Form (1B)	Required for **all** projects!
Regulated Research Institutional/ Industrial Setting Form (1C)	Required for projects that are conducted in a regulated research institution (e.g. universities, medical centres, A*Star research institutes, etc) or industrial setting
Qualified Scientist Form (2)	Required for projects that involve potentially hazardous biological agents, vertebrate animals, controlled substances and humans. **To be signed prior the start of experimentation**
Risk Assessment Form (3)	Required for projects that use hazardous chemicals, activities or devices. If the substance is controlled by the U.S. DEA, the QS will be required to supervise the project. **To be signed prior to experimentation by the DS or QS**
Human Subjects Form (4)	Required for all research that involves humans. **IRB approval is needed before experimentation**
Vertebrate Animal Form (5A)	Form 5(A): Required for all research that involves vertebrate animals conducted in a Non-Regulated Research site. **SRC approval is needed before experimentation**
Vertebrate Animal Form (5B)	Form 5(B): Required for all research that involves vertebrate animals conducted at a Regulated Research Institution. **IACUC approval is needed before experimentation**

Potentially Hazardous Biological Agents Form (6A)	Required for all research that involves microorganisms, rDNA and fresh tissue, blood and body fluids. **SRC/IACUC/IBC/RAC approval is needed before experimentation**
Human and Vertebrate Animal Tissue Form (6B)	Required for all projects using fresh tissue, primary cell cultures, blood, blood products and body fluids. **All projects using any tissue listed above must also complete Form 6A**. If the research involves living organisms, please ensure that proper human or animal forms are completed.
Continuation Projects Form (7)	Required for projects that are a continuation in the same field from a previous year (s)' project.

These forms are to be filled in by the **mentor**:

(a) Regulated Research Institutional/Industrial Setting Form (1C)

(b) Qualified Scientist Form (2)
Required for research involving pathogens; may be required for research involving rDNA, vertebrate animals, controlled substances and humans. Must be signed prior to start of student experimentation

(c) Risk Assessment Form (3)
Required for projects that use hazardous chemicals, activities or devices.

These forms are to be filled in by **teacher-advisor** and **pupil participants**:

(a) Approval Form (1B)

(b) Checklist for Adult Sponsor/Safety Assessment Form (1)
Please note that Adult Sponsor in this form refers to Teacher Advisor

(a) Research Plan (1A) – For individual project

(b) Team Research Plan (1A) – For group projects

(c) Research Plan Attachment

(d) Other forms - if your project involves humans, vertebrate animals, pathogens, controlled substances, recombinant DNA

3 More information for the respective fairs can be found at:

SSEF
http://www.science.edu.sg/ssc/events.jsp?type=17&root=0&parent=0&cat=268

Intel ISEF
http://www.sciserv.org/isef/index.asp