



Republic of the Philippines  
**Department of Education**

05 SEP 2019

DepEd MEMORANDUM


No. **113**, s. 2019

**NATIONAL SCIENCE AND TECHNOLOGY FAIR FOR SCHOOL YEAR 2019-2020**

To: Undersecretaries  
Assistant Secretaries  
Bureau and Service Directors  
Regional Directors  
Schools Division Superintendents  
Public and Private Secondary School Heads  
All Others Concerned

1. The Department of Education (DepEd), through the Bureau of Curriculum Development (BCD) announces the conduct of the **National Science and Technology Fair (NSTF) for School Year (SY) 2019-2020** from February 10 to 14, 2020 at a venue to be announced in a later date. The conduct of the school, division, and regional Science and Technology Fair (STF) shall be held on the following dates:

Level	Date
School	September 2019
Division	October 2019
Regional	November 2019

2. The STF aims to promote Science and Technology consciousness and a culture of innovation among the youth. The NSTF also aims to identify the most creative and innovative student researchers from the Junior and Senior High School who shall represent the country in the international Science research fairs. 

3. In addition to the usual research competition, the **NSTF-Science Academy** shall be held to give the participants opportunity for learning and development through attendance in various talks designed to promote innovation, creativity and excellence in science and research. The Academy Speakers will be selected based from the criteria listed in Enclosure No. 4.

4. The **official participants** from each region at the national level National Science and Technology Fair shall only be the **Rank 1 Regional Winners** in each of the different categories whose entries have been **approved by the National Level Scientific Review Committee (SRC)**. Substitutes shall not be allowed. The description and maximum number of official participants are the following:

<b>Maximum Number of Student Participants per Region</b>	
Life Science Category (4)	
Individual	1
Team	3
Physical Science Category (4)	
Individual	1
Team	3

Robotics and Intelligent Machines Category (4)	
Individual	1
Team	3
Science Innovation Expo (4)*	
Individual	4*
Team	
<b>TOTAL</b>	<b>16*</b>

\*Maximum of 2 individual projects or one individual and a team project.

5. The number of other Official Party members are as follows:

Maximum Number of Other Official Party per Region	
Regional Director	1
Assistant Regional Director	1
Regional EPS-Science	1
Regional EPS-Math	1
Chief Education Program Supervisor-CLMD	1
Research Advisers (Qualified Projects)	2
Observers (one for every six student finalists)	2*

\*Observer slots may be given to the research adviser/s of the student finalist/s or Division Math/Science Education Program Supervisors.

6. The travel expenses and other incidental expenses of the participants in the national level STF shall be charged to local funds or other sources; whereas, the expenses of the BCD staff, board and lodging of official party, materials, transportation and communication relative to the activities, prizes and cash awards, and honoraria of members of the SRC, Board of Judges (BOJs) and external or non-DepEd resource persons shall be charged to the BCD Fund, subject to the usual accounting and auditing rules and regulations.

7. The following documents are enclosed for information and guidance of all concerned:

- Enclosure No. 1 - Guidelines on the National STF 2019-2020,
- Enclosure No. 2 - Schematic Diagram on the Flow of STF Activities,
- Enclosure No. 3 - 2019-2020 Calendar of Important STF Activities and Requirements,
- Enclosure No. 4 - Submission of Interested Science Academy Speakers,
- Enclosure No. 5 - Science Academy Symposium Presenter Application Form,
- Enclosure No. 6 - Format of Research Paper,
- Enclosure No. 7 - Format of Invention Report Paper,
- Enclosure No. 8 - Format of Display Board for the Innovation Expo,
- Enclosure No. 9 - Science Innovation Expo – Process Flow,
- Enclosure No. 10 - Data Submission to BCD by Regional Coordinators,
- Enclosure No. 11 - Updated Checkpoints for SRC Review,
- Enclosure No. 12 - SRC Review and Recommendation Report, and
- Enclosure No. 13 - BOJ Project Evaluation Form.



8. Further, Regional Coordinators (RCs), Division Science and Math Supervisors, School Heads, and Participants are expected to download softcopies of *the International Rules for Pre-college Science Research: Guidelines for Science and Engineering Fairs 2019–2020* from: <https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2020/Rules/Book.pdf> and the fillable forms from: <https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2020/Forms/All.pdf>.

9. The registration fee for each participant is as follows:

Level	Participant	Registration Fee
Division	<ul style="list-style-type: none"><li>• Students with entries</li><li>• Research advisers</li><li>• Supervisors in Science and Mathematics</li></ul>	P2,500
Regional	<ul style="list-style-type: none"><li>• Students with entries</li><li>• Research advisers</li><li>• Supervisors in Science and Mathematics</li></ul>	P5,000
National	<ul style="list-style-type: none"><li>• Research advisers*</li><li>• Observers*</li></ul>	P7,500

\*beyond the number of allowed official party

10. Registration fees shall be charged to local funds, subject to the usual accounting and auditing rules and regulations. This fee will cover board and lodging of the other members of the regional delegation. The subsidy to cover the payment for honoraria of the members of the SRC and BOJ relative to the conduct of Regional STF shall be downloaded to the regions.

11. The RCs are requested to submit to BCD, through email at [nstf@deped.gov.ph](mailto:nstf@deped.gov.ph), the reports using the format provided in Enclosure No. 5 on or before **December 6, 2019**. Failure to submit the report and projects on time shall **disqualify** the region in the national fair.

12. All other activities relative to Science, Technology, Engineering and Mathematics research projects including those of the private associations shall be harmonized with the activities of the NSTF from **February 10 to 14, 2020**. Furthermore, it is also strongly encouraged that the school level STF be participated by all students even those coming from other special interests programs.

13. For more information, please contact **Ms. Anna Liza M. Chan**, Senior Education Program Specialist, Bureau of Curriculum Development-Curriculum Standards Development Division, 3rd Floor Bonifacio Building, Department of Education Central Office, DepEd Complex, Meralco Avenue, Pasig City through email at [nstf@deped.gov.ph](mailto:nstf@deped.gov.ph) or at telephone nos. (02) 632-7746 and (02) 635-9822.

14. Immediate dissemination of this Memorandum is desired.

  
**LEONOR MAGTOLIS BRIONES**  
Secretary

Encls.:

As stated

Reference:

DepEd Memorandum No. 134, s. 2018

To be indicated in the Perpetual Index  
under the following subjects:

CELEBRATIONS AND FESTIVALS  
CONTESTS  
LEARNING AREA, SCIENCE  
SCHOOLS  
STUDENTS

SMMA, DM National Science and Technology Fair for School Year 2019–2020  
0456 – July 9/23, 2019

## **GUIDELINES ON THE NATIONAL SCIENCE AND TECHNOLOGY FAIR 2019 - 2020**

Similar to the previous national level fair, the National Science and Technology Fair (STF) for 2019 -2020 is an ISEF-affiliated fair. As such, the requirements for affiliated fairs should be met and followed as stated in the ISEF guidelines mentioned on the succeeding pages of this Memorandum.

### **1. The Science Fair**

The Bureau of Curriculum Development of the Department of Education (DepEd-BCD) shall conduct the **National STF 2019 -2020** on **February 10 to 14, 2019**.

The STF aims to promote Science and Technology consciousness and a culture of innovation among the youth. The NSTF also aims to identify the most creative and innovative student researchers from the Junior and Senior High School who shall represent the country in the international Science research fairs.

In addition to the existing research competition, there shall be other activities within the fair as described below.

#### **1.1 National Science Innovation Expo**

Innovation Expo is designed to showcase products and innovation of learners. It aims to crowd-source and display Science and Technology innovations and solutions to everyday challenges. Furthermore, it also aims at developing appropriate technologies, in particular, by taking advantage of patent information for identifying suitable solutions to technical problems.

The format of the paper is found in **Enclosure No. 6**.

The region can send two (2) inventions.

**Gawad Aglitekno (Ag – Agham, Li – Likha, Tek –Teknolohiya)** shall be awarded to the most innovative invention exhibited at the fair.

### **2. The Research Competitions**

The competitions will be conducted among Junior and Senior High School students from both public and private schools. The first place winners in each of the categories at the Regional level shall represent the region to the National STF competition as approved by the national Scientific Review Committee (SRC).

The competition will start at the school level advancing to the division, regional, national then to the international level. Regional Science High Schools (RSHSs) are **expected** to join the regional fair directly. RSHSs may submit only one entry per category or a maximum of six (6) projects in the regional fair.

The participation of schools in the NSTF shall be clustered into **three major categories**: Life Science, Physical Science, Robotics and Intelligent Machines and Science Innovation Expo. These major categories are further classified into different subcategories.

Life Science (LS)		Physical Science (PS)		Robotics and Intelligent Machines (RIM)		Science Innovation Expo(SIE)
Individual Project	Team Project	Individual Project	Team Project	Individual Project	Team Project	2 inventions (Individual or Team)

### 3. Levels of Research Competition

#### School/Division Level

The conduct of the school/division level shall be done on a weekend to conform with **DepEd Order No. 7, s. 2019 (Calendar of School Events and Activities For SY 2019-2020)**. The school and division level STF should refer to Enclosure No. 3 for the schedules of the competition.

The following are the forms and manuscripts to be submitted in **ALL levels** of the competition:

1. RESEARCH PLAN
2. FORMS for all the projects
  - A. Checklist for Adult Sponsor
  - B. Student Checklist (1A)
  - C. Research Plan (NOTE: No need to attach the Research Plan Instructions )
  - D. Approval Form (1B)
  - E. Regulated Research Institutional/Industrial Setting Form (1C)
3. FORMS depending on the type of research (e.g involving humans, vertebrate animals, hazardous chemicals, etc.)
  - A. Qualified Scientist Form (2)
  - B. Risk Assessment Form (3)
  - C. Human Participants Form (4)
  - D. Human Informed Consent Form
  - E. Vertebrate Animal Form (5A)
  - F. Vertebrate Animal Form (5B)
  - G. Potentially Hazardous Biological Agents Risk Assessment Form (6A)
  - H. Human and Vertebrae Animal Tissue Form (6B)
  - I. Continuation Project Form (7)
4. Abstract (**Maximum of 250 words**)  
 The abstract should include the following:
  - A. Purpose of the experiment
  - B. Procedure
  - C. Data conclusion

The abstract may NOT include the following:

  - A. Acknowledgement
  - B. Work of procedures done by the mentor
5. Research Paper (Include the Title Page, Abstract, Main Body, and References)
6. Project Evaluation Form (see Enclosure No.11)
7. Scanned copy of the log book in pdf format

Project of proponents should have been screened by the Institutional Review Board (IRB)/Scientific Review Committee (SRC) at the school-level. All school level winners must be certified by the division SRC to join in the division-level fair.

The Division Science/Mathematics Supervisor shall be a member of the BOJ who shall determine the school/division winners of the different categories and fair divisions.

With the exception of RSHSs and PSHSs, students of both regular and science high schools of private and public high schools shall participate in the division-level STF.

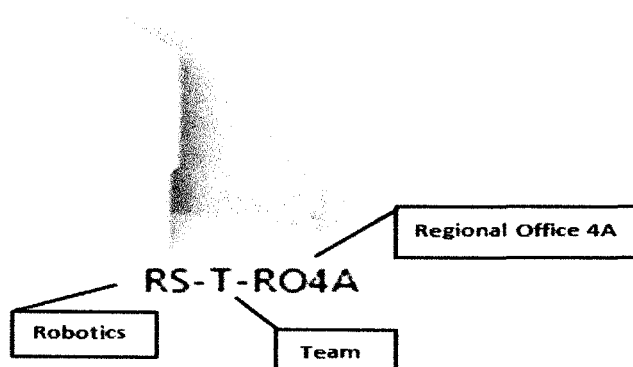
Winners at the school level shall be officially endorsed to the division office for the division-level. Likewise, the division-level winners shall be officially endorsed to the regional office.

### Regional Level

The first place winners at the division level in both clusters shall be properly scrutinized by identified members of the SRC for the regional level competition.

The official list of the **first place winners at the regional level**, report on the conduct of STF, **hard and soft copies** of the manuscripts and other necessary documents shall be officially **endorsed by the Regional Office to DepEd Central Office through the Bureau of Curriculum Development**. The soft copies must be saved in the CD containing six (8) **folders representing the eight projects from each category**. Each folder must contain the manuscripts in **Pdf format** and another folder containing all the required forms including the the research logbook.

Example:



Folder Code	Content of the Folder	Sample Content of the folder for Forms
<b>LS-I-RO1</b>  *life science-individual-region 1	Manuscript: <b>LS-I-RO1-School Name</b>	-
	Folder containing the needed forms: <b>LS-I-RO1-Forms</b>  *name of the folder where all the soft copies of the necessary forms are found	<b>LS-I-RO1-Form 1</b>
		<b>LS-I-RO1-Form 2</b>
		<b>LS-I-RO1-Logbook</b>

LS-I-RO1

LS-T-RO1

PS-I-RO1

PS-T-RO1

→
LS-I-RO1-Forms
→

LS-I-RO1-Datalogbook.pdf

LS-I-RO1-Form1.docx

The **REPORT OF THE CONDUCT** of the STF shall include the following:

1. Title
2. Table of Contents
3. Introduction/Rationale
4. Detailed Information
  - General information
  - SRC Deliberation (include the results , findings and recommendations)
  - Program of Activities (day-to-day activities)
  - List of Entries (include the brief profile of the research adviser of each entry)
  - List of Winners (Research & Innovation Congress)
  - Trend Analysis (results from 3 consecutive years)
  - Financial Report
5. Conclusions
6. Recommendations
7. Appendix

### **National Level**

The Finalists approved by the National SRCs of the eight (8) categories shall represent the region to the national-level STF to be conducted on February 10 to 14, 2020 at a venue to be announced later.

Furthermore, the final results of the deliberation of the National SRC's and the National Board of Judges will be **final and irrevocable**.

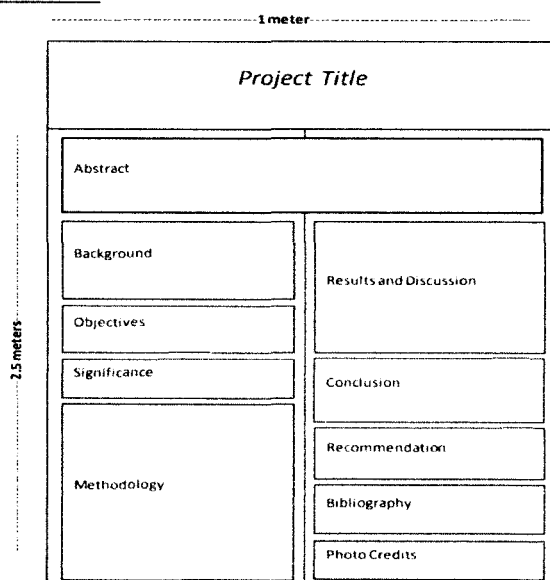
### **4. The Research Project**

Science research projects must conform with international rules and standards published by the Society for Science and the Public, the ***International Rules for Pre-college Science Research: Guidelines for Science and Engineering Fair 2020***. Each project is expected to have a Research Adviser and an Institutional Review Board (IRB) or a Scientific Review Committee (SRC).

The research project should cover a maximum of twelve (12) continuous months from January 2019 to December 2019.

**Ethics Statement. Scientific fraud and misconduct is not condoned at any level of research or competition. Plagiarism, use or presentation of other research's work as one's own and fabrication of data will not be tolerated. Fraudulent projects are disqualified from the competition.**

### **5. Exhibit – Format\***





## 5.1 Display and Safety Regulations

The project display using **photo paper** summarizes the research project and must focus on the proponent's work for this year's study, and if applicable, with only minimal reference to previous research. **Tarpaulins will not** be used in the NSTF in support of the environmental advocacy of the government in reducing the consumption of non-biodegradable or non-recyclable materials.

The **safety regulations** that must adhere to or should be consistent with the guidelines found on page 27 of the ISEF guidelines (<https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2020/Rules/Rules-Only.pdf>).

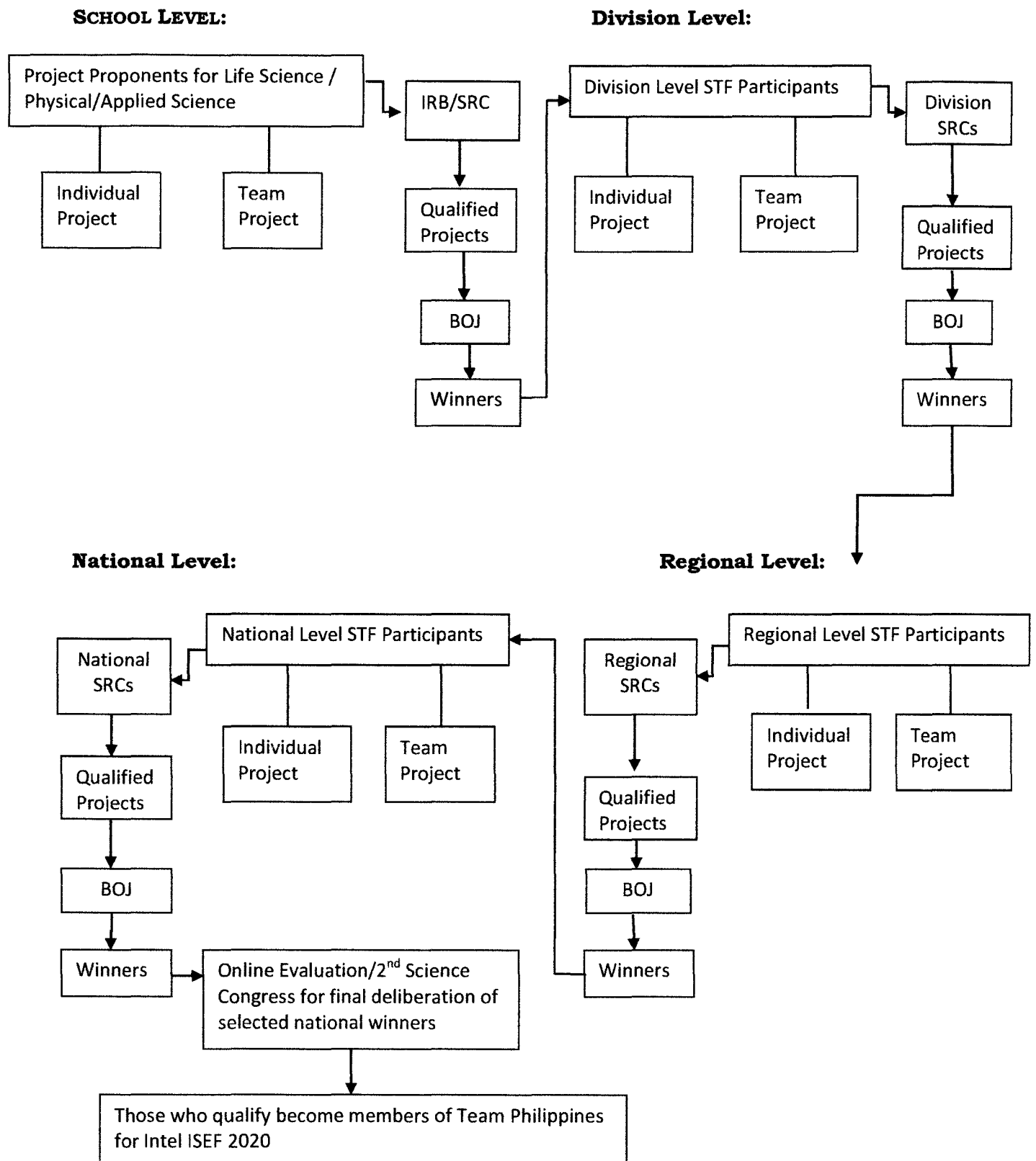
The following items should be seen in the project display: Abstract, Background, Objectives, Significance, Methodology, Results and Discussion, Conclusion, Recommendations, Bibliography and if applicable, Photo Credits (including illustrations and graphics).

*(Note: A proponent should **not** include his/ her face in the project's procedure/illustration in the display.)*

### 5.1 Requirements for presentation by the Project Proponent/s to the BOJ during the exhibit are the following:

- Copy of the required forms
- Copy of the research write-up
- Project data book or student journal complete with dates of entry, number of pages, and all other details (Refer also at ISEF Student Handbook website:
- (<https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2020/Rules/Rules-Only.pdf>).

6. In addition to the usual research competition, the **National Science & Technology Fair Academy** shall be held to give the participants opportunity for learning and development through the attendance in various shop talks designed to promote innovation, creativity and excellence in science and research education. Details are found in Enclosure Nos. 4 and 5.

**SCHEMATIC DIAGRAM OF THE FLOW OF STF ACTIVITIES**

**CALENDAR OF IMPORTANT STF ACTIVITIES AND REQUIREMENTS**

<b>Activity</b>	<b>Date</b>	<b>Required Items/Expected Output</b>	<b>Persons Involved</b>	<b>Venue</b>
Submission to BCD of the Regional entries <u>properly endorsed by the RO</u>	on or before December 6, 2019	Hard copy of each project and soft copies of the project to be submitted to BCD and emailed to <a href="mailto:nstf@deped.gov.ph">nstf@deped.gov.ph</a>	BCD Staff Project proponents Project advisers Dept. Heads / Div. and Regional Science and Math Supervisors	RO to BCD-CSDD
Submission of entries to National SRCs	on or before December 8, 2019	Complete copies of write-ups (Hard and soft copies) in google drive	BCD Staff Regional Science and Math Supervisors	Identified addresses
Submission of entries to BCD of the regional entries for the National Science Innovation Expo	December 6, 2019	Complete copies of write-ups (Hard and soft copies) in google drive	BCD Staff Regional Science and Math Supervisors	Regional Science and Math Supervisors
Meeting of SRCs members for deliberation and submission of consolidated SRC forms	January 13 - 14, 2020	Complete copies of write-ups (Hard and soft copies) in google drive Master list of participants Master list of SRCs Evaluation Form for SRCs List of qualified Projects	Identified SRCs BCD Staff	BCD Conference Room
First round of selection	January 13 - 14, 2020	Innovation Expo DepEd Memo, Complete copies of write up (hard and soft) and products		
Meeting of RCs and return of manuscripts /write-ups to RCs	January 15 - 16, 2020	Affiliated Questionnaire matrix (master list of proponents using ISEF matrix) Evaluation Forms per project with SRC comments	RCs Project Proponents	BCD Conference Room
Submission of Revised Write-up to BCD	February 3, 2020	Through google drive or emailed to <a href="mailto:nstf@deped.gov.ph">nstf@deped.gov.ph</a>	Regional Coordinators BCD Staff	BCD-CSDD
Submission of write-ups to identified BOJs	February 4, 2020	one copy each of the identified BOJ	BCD Staff	Identified addresses
Actual conduct of the National STF	February 10 - 14, 2020	Display posters Hard copies of write ups and actual projects	Regional delegates Project advisers RCs and BOJ	To be announced
Online Mentoring of Top Entries	February to April 2020	Revised Research Papers	Participants, advisers, Research mentors, Regional supervisors and BCD staff	N/A
Actual Deliberation	April 24, 2020	Official List of Philippine Delegates to Intel ISEF	Online Mentors Finalists	To be announced
Science Cliniquing	May 4 - 8, 2020	Finalized Research Papers and Posters	Mentors and Philippine Delegates	To be announced

**Submission of Interested Science Academy Speakers**

**I. Background**

The Science Academy is a series of symposium that allow teachers, fair directors, and other interested adults the opportunity to present and discuss issues related to science education, the management of science fairs, to highlight successful practices in education, and scientific and engineering research.

Symposia sessions can be a hands-on workshop, lecture-type presentation, or panel discussion. A symposium must be educational in nature and may not directly or indirectly promote a commercially available product or service. Audiences may include any registered fair participant including student finalists, student observers, fair directors, teachers, corporate sponsors, or professional scientists.

**II. Who Can Present in the Symposium Session?**

1. Any individual who is a registered adult fair participant, but not a current finalist.
2. Science experts and educators.

*\*If your organization is interested in promoting a commercially available product or service, please send inquiries at [nstf@deped.gov.ph](mailto:nstf@deped.gov.ph) to discuss exhibiting at the National Science and Technology Fair Public Day and other potential opportunities.*

**III. How to Apply?**

Please accomplish the form Enclosure 5 and send to [nstf@deped.gov.ph](mailto:nstf@deped.gov.ph) on or before the deadline on December 15, 2019.

**IV. Criteria for Selecting Presenters**

When we review your application, we'll be looking for the following:

1. *Content* - Does the application clearly describe the proposed Symposium session?
2. *Accuracy and Completeness* - Is the information provided complete?
3. *Relevance* - Is the proposed session of interest to NSTF participants?
4. *Appropriateness and Timeliness* - Is the proposed session topic timely/appropriate?

**V. Selection Committee**

A selection committee will review the entire application to check the completeness of the information provided, but will focus on the 100–150 word summary. The Fair will not be able to accept every proposal submitted.

Applications that have been accepted will receive a confirmation via email by mid-January 2020. Please read all the information carefully and contact us immediately with any changes.

**VI. Symposia Session Cancellations or Changes**

If you need to cancel your session, please do so right away—this may give someone else a chance to present. Once a Symposium session is assigned, we will not be able to make any changes to the schedule.

**VII. How Will My Symposia Session Appear in the Program?**

Symposia Sessions will be listed in the NSTF Program of Activities. Listings will include the time, date, and name of your Symposium session, the intended audience, and a description of your session. This description will be taken from the first page of your application form and edited if necessary. Please try to describe your session accurately.

**VIII. What Audiovisual Equipment Will Be Available?**

The National Science and Technology Fair Committee will provide an LCD projector, screen, microphones and sound for the standard audio headphone port for all Symposia sessions. We do not provide phone lines, computers, or cables for your laptop other than a VGA cable. Presenter must provide own laptop. Internet access is available upon request; it is a wireless connection only.

If your presentation requires anything other than what is provided by the Fair Committee, please indicate specifics on the application. For questions, please send an email to Ms. Anna Liza Chan. Applications may be sent to email address: [nstf@deped.gov.ph](mailto:nstf@deped.gov.ph) on or before **December 15, 2019**.

Symposia sessions are an opportunity to share information with students, parents, teachers, and faculty, and do not imply endorsement by the Department of Education.

No fees have been paid and no endorsement of the sessions is implied.

**Science Academy Symposium Presenter Application Form**

I. Presenter Information

Lead Presenter

Name: \_\_\_\_\_ Region: \_\_\_\_\_

Office/School/Institution: \_\_\_\_\_

Address: \_\_\_\_\_ Age: \_\_\_\_\_

Designation: \_\_\_\_\_ Email: \_\_\_\_\_

Cell Phone: \_\_\_\_\_

Other presenters(if applicable)

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

II. Session Information:

Title (Must clearly describe session. 15-word maximum)

\_\_\_\_\_  
\_\_\_\_\_

Brief Description (25-word limit to be used in program listing)

\_\_\_\_\_  
\_\_\_\_\_

III. Type of Session

☐ Hands-on Workshop ☐ Presentation ☐ Panel Discussion

IV. Length of Session

☐ 30 minutes ☐ 45 minutes ☐ 60 minutes

V. Intended Audience

☐ Directors ☐ Teachers ☐ Students

VI. AV Equipment Required:

NSTF- NTWG will provide an LCD projector, screen, microphones and sound for the standards audio headphone port for all Symposia sessions. We do not provide own computers or cables for your laptop other a VGA cable. **Presenter must provide own laptop.** Internet access is available upon request; it is wireless connection only. If your presentation requires anything other than what is provided by the NSTF-NTWG, please indicate specifics below:

\_\_\_\_\_

VII. Safety Information:

Identify any potential safety hazards associated with your proposed application and what precautions will be taken to deal with these hazards.

VIII. Session Information:

Please describe your proposed presentation in 100 – 150 words **ONLY**.

IX. Brief bio of Lead presenter (100 words maximum)

Application deadline is December 15, 2019. Please email to [nstf@deped.gov.ph](mailto:nstf@deped.gov.ph)  
**SUBJECT:SCIENCE ACADEMY by December 15, 2019.** Include your application form, resume of the primary presenter, powerpoint in PDF and sample of any handouts you plan to give to your audience. Incomplete requirements will not be entertained.

*I have read and fully understand the guidelines and requirements for a Symposium Presentation. All of the information provided is correct to the best of my knowledge. I understand that not all applications are approved; I will accept the decision of the NSTF NTWG 2020 Symposium Selection Committee as final.*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

### **Format of Research Paper**

Investigatory papers that were reviewed by the national SRCs in the past years were found to have inadequacies in the content, particularly in the areas cited below. To ensure that the investigatory papers are of good quality, students must adhere to the guidelines shown below. These can be found in the Guidelines and in the Student Handbook and Research Plan Instructions published in the website (<https://www.societyforscience.org>).

**I. Research Plan:** (This is compiled separately from the rest of the investigatory paper):  
All projects should include the following:

- A. Question or Problem being addressed
- B. Goals /Expected Outcomes /Hypotheses
- C. Description in detail of method or procedures (The following are important and key items that should be included when formulating ANY AND ALL research plans.)
  - Procedures: Detail all procedures and experimental design to be used for data collection.
  - Data Analysis: Describe the procedures to be used to analyze the data/results that answer research questions or hypotheses.
- D. Bibliography: List at least five (5) major references (e.g. science journal articles, books, internet sites) from your literature review. If you plan to use vertebrate animals, one of these references must be an animal care reference.

**II. Project Data Book:**

A project data book is your most treasured piece of work. Accurate and detailed notes make a logical and winning project. Good notes show consistency and thoroughness to the judges and will help you when writing your research paper. Data tables are also helpful. They may be a little 'messy' but be sure the quantitative data recorded is accurate and that units are included in the data tables. Make sure you date each entry.

**III. Abstract:**

The abstract should be **250 words or less**. Do not discuss specific aspects of the research in great detail, including experimental procedures and statistical methods. Any information that is unnecessary to include in a brief explanation should be saved for the written research paper or the project exhibit board.

If the project is a continuation from a previous year, the abstract should summarize the current year's work only. If mention of supporting research from previous year(s) is necessary, it must be minimal.

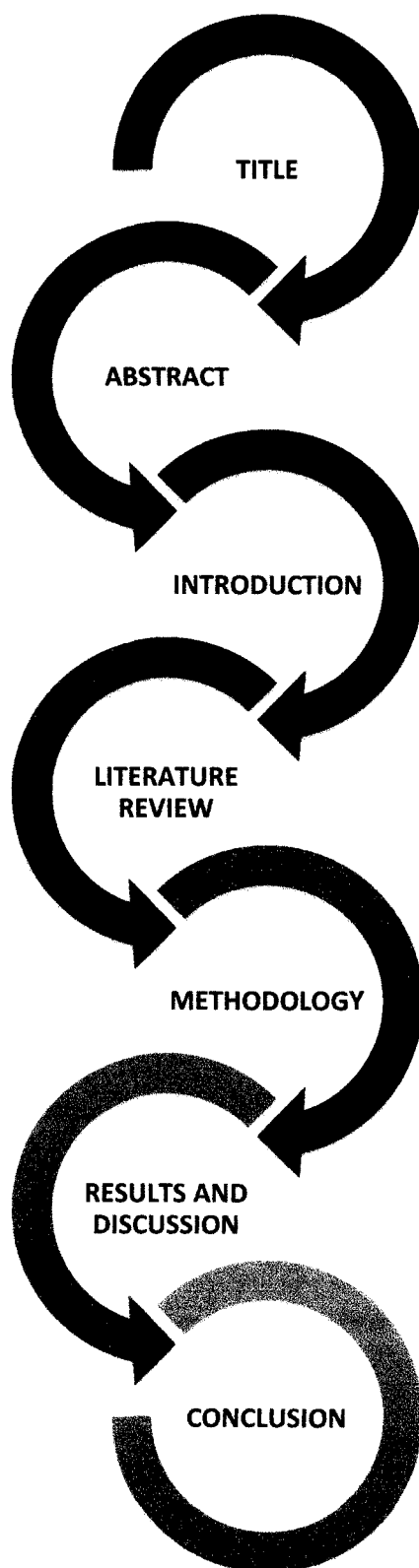
If the abstract text includes special characters, such as mathematical symbols, which won't be translated electronically, please spell out the symbol.

Do not include acknowledgements in the abstract. This includes any references to mentors, institutional facilities, and awards or patents received.



#### IV. **Research Paper:**

A research paper should be prepared and available along with the project data book and any necessary forms or relevant written materials. A research paper helps organize data as well as thoughts. A good paper includes the following sections.



### Sample Abstracts

2018 ISEF Second Grand Award, Energy Physical	2018 ISEF Third Grand Award, Earth and Environmental Science
Solar-Tracking Adaptive Robot PV Panels	Biosorption of Manganese Mine Effluents Using Crude Chitin from Shell Wastes of Philippine Bivalves
By Cadore, Keith Russel ; Rivera, Eugene ; Manzanero, Joscel Kent Adviser: Johnny T. Samino	By Saquin, Elaine ; Molejona, Randt Adviser: Ronilo Aponte
<p>The leading sources of energy globally are oil, coal, and natural gas - fossil fuels that can be depleted, and whose access and use greatly impact the environment. Hence, much study has been made of renewable energy sources and use, including harnessing solar power through a photovoltaic cell. The study aimed to improve the power harvesting and generating capacity of photovoltaic cells by designing and building a solar device that mimics a flower opening when the sun is out, tracks the sun's movement, closes when the light source is no longer detected and responds to humidity and temperature to maximize power generation. Six (6) photovoltaic panels are mounted on a base operated by servo motors and controlled by Arduino module. Electronics, servo motors, Arduino, and humidity sensors were acquired commercially. Other material included those repurposed from a broken umbrella and electric fan, and scrap acrylic sheets. The device's performance was compared to that of a fixed-mounted photovoltaic panels at different angles. The fixed setup generated 4.71W while the petal panels produced 6.95W, a 47.72% increase. Taxing the power consumption of the device to the power it generates gives an average of 6.09W. This translates to a 29.29% improvement from the 4.71W generated by the fixed panel setup. T-Test for Dependent Means was used and showed that there is a significant difference between the power generations of the two setups (<math>p = 0.000261</math>, <math>\alpha = 0.05</math>). This robotic design amplifies capacity to harness solar power through a photovoltaic cell.</p>	<p>The area around Ajuy river in Iloilo, Philippines is currently being mined for manganese ore, and river water samples exceed the maximum manganese contaminant level set by US-EPA. At the same time, the surplus of local bivalve waste is another environmental concern. Studies show that chemical treatment compromises water quality leaving toxic residues, and an alternative treatment process is biosorption, or using the physical and chemical properties of a biomass to adsorb heavy metals in contaminated water. The study aims to extract crude chitin from shell wastes of <i>Bractechlamys vexillum</i>, <i>Perna viridis</i>, and <i>Placuna placenta</i> and determine its adsorption capacity on manganese in simulated and actual mine water. Crude chitin was obtained by pulverization, deproteinization, demineralization, and decolorization of shells. Biosorption by flocculation followed 5 g: 50 mL chitin-to-water ratio. Filtrates were analyzed using MP-AES after 24 hours. In both actual and simulated mine water respectively, <i>B. vexillum</i> yielded the highest adsorption percentage of 91.43% and 99.58%, comparable to <i>P. placenta</i> of 91.43% and 99.37%, while significantly different to <i>P. viridis</i> of -57.14% and 31.53%, (<math>p &lt; 0.05</math>). FT-IR validated the presence of chitin in shells based on carbonyl-containing functional groups at peaks 1530-1560 <math>\text{cm}^{-1}</math> and 1660-1680 <math>\text{cm}^{-1}</math>. SEM micrographs showed the amorphous and non-homogenous structure of chitin. Thus, crude chitin from <i>B. vexillum</i> and <i>P. placenta</i> can be bio-sorbents for water treatment of manganese-impacted effluents, and promote appropriate waste management of local bivalves</p>

**Format of Paper Invention Report**

**Invention Report Paper:**

- a) **Title Page and Table of Contents:** The title page and table of contents allows the reader to follow the organization of the paper quickly.
- b) **Introduction:**
- 1) **Features and Specifications** – This describes the details of your invention.
  - 2) **Market Trends and Opportunities** – This part of the report must include three items: what inspired you to develop this invention, an explanation of what problem your invention will solve, and describe in detail how you determined that the invention that you created did not already exist. Explain what products are already on the market that are somewhat like your invention and describe how yours differs.
- c) **Materials and Methods:** Describe in detail how you made your invention. Explain what materials were used and how you put them together to make your invention. Your report should be detailed enough so that someone would be able to repeat the steps and make your invention. Directions on how to use the invention are also necessary here. You must include a detailed drawing(s) of your invention.
- d) **Results and Discussion:** This is the essence of your paper. Compare your results with theoretical values, published data, literature and related studies, commonly held beliefs, and/or expected results. Include a discussion of possible errors, statistics, graphs, pages with your raw collected data, etc. How did the data vary between repeated observations of similar events? How were your results affected by uncontrolled events? What would you do differently if you repeated this project? What other experiments should be conducted?
- f) **Conclusions:** This discusses the potential applications, possible customer benefits, and the impact of the problem in solving problems and issues of today and tomorrow.
- g) **Acknowledgements:** You should always credit those who have assisted you, including individuals, businesses and educational or research institutions.
- h) **References/Bibliography:** Your reference list should be written based on the Chicago Manual of Style. For more information, you may visit the websites below:

- <http://www.chicagomanualofstyle.org/home.html>
- <http://www.calvin.edu/library/knightcite/index.php>

For more information about this event please contact Ms. Anna Liza Chan at [annaliza.chan@deped.gov.ph](mailto:annaliza.chan@deped.gov.ph) for details.

**Format of Display Board for the Innovation Expo**

6.1 Sample Format of Display Board for Science Innovation Expo

<b>Title</b>	The title should be short but would capture the essence of the product/invention
<b>Picture</b>	picture of the product/invention only
<b>Overview</b>	What problem is solved by the invention? What are the existing solutions and what limitations do these solutions have?
<b>Key Features</b>	What are the novelty features of this invention?
<b>Benefits and Impact</b>	What are the benefits/impact of this invention to humans?
<b>Developers' Name</b>	Who is/are the inventors?

**Specifications:**

Each Display Board must have a 38" x 48" dimensions (portrait style)

**Judging Criteria:**

The following **criteria** are used to evaluate each project:

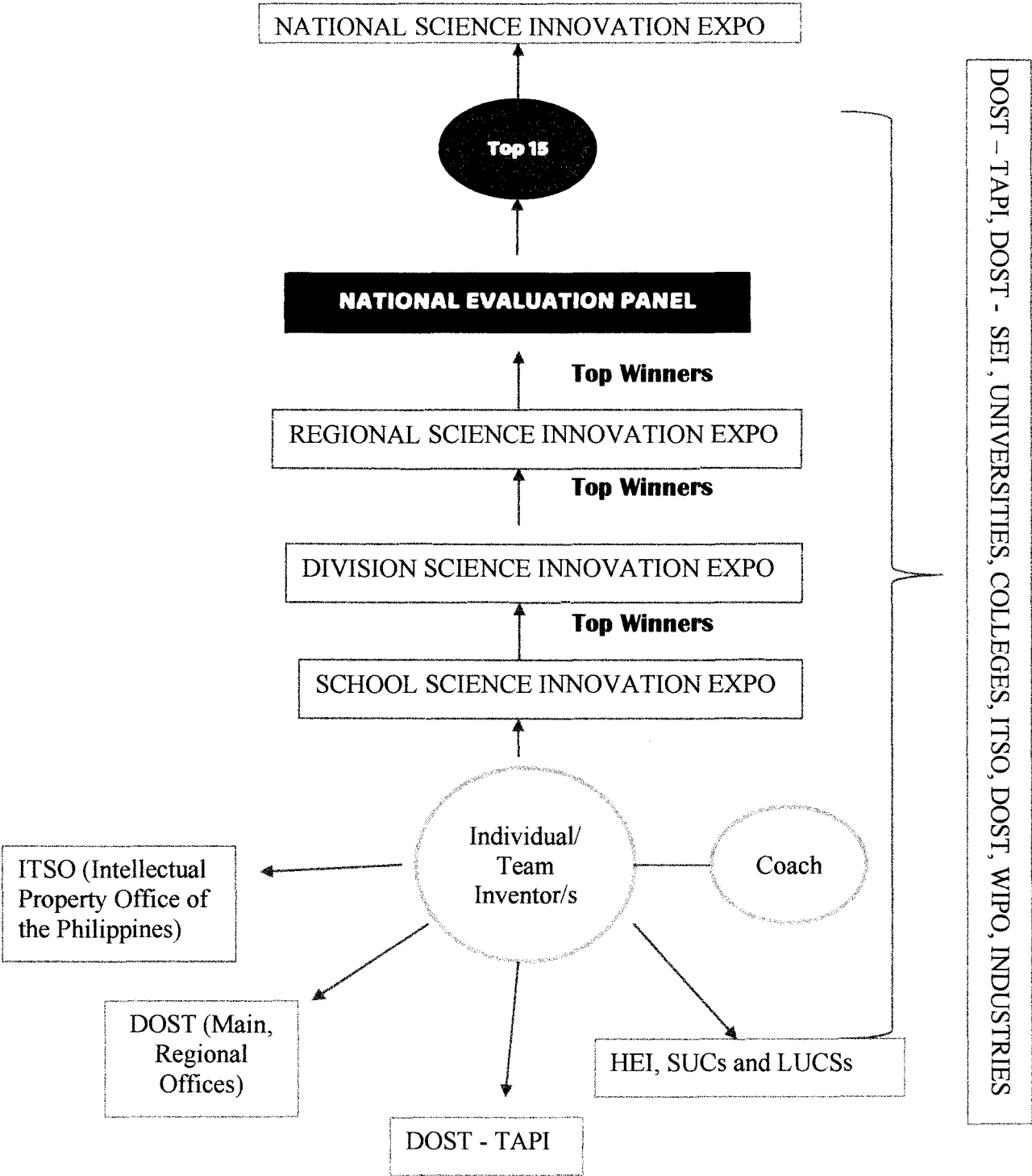
- (a) *Originality & Innovation..... (30 %)*
- (b) *Community Connection & Impact.....(25 %)*
- (c) *Functionality and Quality.....(25%)*
- (d) *Utilization of Patent Information.....(20%)*

The following are the **members of the evaluation panel** in each level:

A group eight or more judges composed of the ff. listed below shall be members of the evaluation panel who will select the qualified winners in each level:

- (a) patent experts
- (b) industry experts
- (c) business experts
- (d) business professionals
- (e) scientists
- (f) field experts
- (g) regional/division supervisors

**National Science Innovation Expo - Process Flow**



**Data for Submission to BCD by the Regional Coordinators**  
(to be used in the official endorsement of the school to division, division to region and region to central office)

This should be in an **Excel spreadsheet** and should be sent to email address: [nstf@deped.gov.ph](mailto:nstf@deped.gov.ph) on or before **December 6, 2019**. Please take note of the sample below:

Region: \_\_\_\_\_

Division: \_\_\_\_\_

No.	First Name	Middle Name	Last Name	Grade	High School	Gender	Team / Individual	Team Code	Research Adviser
1	Dona Vel	C.	Lagurin	10	Bayugan Nat'l Compre HS, Bayugan City	F	Individual	—	Jonathan f. Garzon
2	*Venessa Anne Kimberly	M.	Gealan	10	CARAGA RSHS, Surigao Cty	F	Team	1	Maria Ruth Edradan
3	*Quenee Lavern	G.	Pongcol	10		F	Team	1	
4	*Ivy Jean	J.	Turno	10		F	Team	1	
5	Bianca	A.	Muñez	10	Bunawan NHS, Agusan del Sur Bunawan NHS, Agusan del Sur Bunawan NHS, Agusan del Sur	F	Team	2	Jennyvi H. Papellero
6	Farrah Leah	U.	Ebe	10		F	Team	2	
7	El Veena Grace	A.	Rosero	10		F	Team	2	
8	Bryll Jay	I.	Salazar	9	Agusan del Sur NHS, Agusan del Sur	M	Individual	—	Emy S Dacoseo
9	Lea	S.	Aparente	10	Bayugan Nat'l Compre HS, Bayugan City	F	Team	3	Jonathan F. Garzon
10	Jayson Rey	R.	Vicariato	10		M	Team	3	
11	Justin Ryan	S.	Togonon	10		M	Team	3	

Prepared by \_\_\_\_\_ Mobile No. \_\_\_\_\_

School/Office Address and Phone No.: \_\_\_\_\_

Regional Coordinator: \_\_\_\_\_

**Note:**

1. **Team code number** is used to indicate the number of teams that joined the Division STF and the member of each team.
2. Include all the schools that participated in the Division STF.
3. Insert an *asterisk* before the first name of students who are qualified to join the National STF.
4. Insert an *asterisk* before the school name whose student-proponents are in the Special Science Classes of S&T-Oriented High Schools or Science, Technology and Engineering (STE) program .

**UPDATED CHECKPOINTS FOR SRC REVIEW**

Source: Society for Science and the Public

This document was developed to provide guidance for an SRC to review a project after experimentation.

TYPE OF FORM	WHO WILL FILL OUT?	WHEN TO FILL OUT?	WHEN IT IS REQUIRED?
<b>Form 1</b> - Checklist for Adult Sponsor	Research Adviser	Before experimentation	Required for all Projects
<b>Form 1A</b> - Student Checklist	All student researchers	Before experimentation	Required for all Projects
<b>Form 1B</b> - Approval Form	All student researchers	Before experimentation	Required for all Projects
Research Plan/Project Summary	All student researchers	Before experimentation	Required for all Projects
<b>Form 1C</b> - Regulated Research Institution/Industrial Setting Form	Adult supervising	After experimentation	Required if research conducted in a regulated research institution, industrial setting or any work site other than home, school or field
<b>Form 2</b> - Qualified Scientist Form	Qualified Scientist/Adult Supervising	Before experimentation	Required if research involving human participants, vertebrate animals, potentially hazardous biological agents and hazardous
<b>Form 3</b> - Risk Assessment Form	Student Researcher/s Qualified Scientist/Adult Supervising	Before experimentation	Required for all Projects
<b>Form 4</b> - Human Participants Form	Student Researcher/s Institutional Review Board	Before experimentation	Required if research involves human participant  <i>*if in a regulated research institution use institutional approval forms</i>
<b>Form 4A</b> - Human Informed Consent Form	Student Researcher/s Research Participant	Before experimentation	Required if research involves human participant
<b>Form 5A</b> - Vertebrate Animal Form	Student Researcher/s Scientific Review Committee  Veterinarian  Designated Supervisor/Qualified Scientist	Before experimentation	Required for all research involving vertebrate animals that is conducted in a school/home/field research site
<b>Form 5B</b> - Vertebrate Animal Form	Student Researcher/s Qualified Scientist	Before experimentation	Required for all research involving vertebrate animals that is conducted in Regulated Research Institution
<b>Form 6A</b> - Potentially Hazardous Biological Agents Risk Assessment Form	Student Researcher Qualified Scientist/Designated Supervisor  Scientific Review Committee	Before experimentation	Required for research involving microorganisms, rDNA, fresh/frozen tissue (including primary cell lines, human and other primate established cell lines and tissue cultures), blood, blood products and body fluids.
<b>Form 6B</b> - Human and Vertebrate Animal Tissue	Student Researcher Qualified Scientist/Designated Supervisor	Before experimentation	Required for research involving fresh/frozen tissue (including primary cell lines, human and other primate established cell lines and tissue cultures), blood, blood products and body fluids. If the research involves living organisms please ensure that the proper human or animal forms are completed.
<b>Form 7</b> - Continuation/Research Progression Projects Form	Student Researcher	Before experimentation	Required for projects that are a continuation/progression in the same field of study as previous project.

## **PREAPPROVAL:**

**Human Participants:** Does the study mention people, interviews, responses, answers, consent, etc? (requires Form 4). Exempt studies include prototype/invention testing if only done by student researcher, public data review, some observational studies. All others require IRB preapproval.

**Animals:** Look for indications of type of study and research site. Strictly observational studies with no interaction are exempt. Tissue studies in which the student is given the tissue and did not interact with the animal do not need animal forms but will still need preapproval as a PHBA tissue study.

A. Projects may be conducted at home, school, or field ONLY IF the study involved agricultural, behavioral, observational, or supplemental nutrition AND was non-invasive AND had no negative effects on health and wellbeing (requires Form 5A).

B. Projects must be conducted at research institution with IACUC preapproval in all other cases (requires Form 5B).

**PHBA's Study included microorganisms, rDNA, or fresh/frozen tissue, blood, body fluids.** Used terms like culturing, plating, tissue, source of tissue, etc. Exemptions include non-primate established cell lines, yeast, lactobacillus, meat from a grocery store, and other items listed in the rules (all non-exempt PHBA's require Form 6A and IRB pre-approval; tissue studies require Form 6A, 6B, and IRB pre-approval)

Was the study done at a Regulated Research Institute/Industrial Setting (RRI)? Is the terminology or equipment very sophisticated? Look for possible RRI. (Form 1C)

Does this appear to be a Continuation? Any mention of previous research? Uses terms like previously, earlier research, improved, redesigned, year 3, etc. (Form 7)

Any discussion of a Partner in a non-team study? Uses "we" consistently (math projects and international studies frequently use "we" for all studies). Form 1C answers this question for studies done at a university.

Any possibly hazardous chemicals, activities, or devices? Includes high voltage, hazardous equipment, radioactivity, firearms, explosives, prescription drugs, DEA-controlled substances, alcohol and tobacco. (Form 3)

Time Line: Project appears too long/too old: more than one year or started before January of last year. (Form 1A contains this information)

## **CHECKBOXES ON ABSTRACT**

Checkbox 1. Project involved human participants, vertebrate animals, or PHBA's. Requires preapproval and additional forms. Exempt studies do not check this box.

Checkbox 2. Abstract may only reflect their work not the mentor's. May require abstract rewrite.

Checkbox 3. Worked at RRI. (Requires 1C)

Checkbox 4. Project is a continuation. (Requires Form 7, previous abstract & research plan)



## **CHECKLIST FOR ADULT SPONSOR (1)**

This form asks more specifically about projects that required preapproval (humans, animals, PHBA's), continuations, RRI's, and lists the forms that are required. The answers to this checklist need to be consistent with the answers on other forms.

This page is signed when the project is reviewed which should be before the project starts.

### **STUDENT CHECKLIST (1A)**

Grade: Student must have been in high school at time of research in order to compete.

Contact information: If questions cannot be resolved from the paperwork, it is sometimes necessary to contact the student or adult sponsor.

Continuation: If a continuation, must include Form 7, previous abstracts, and last year's research plan. This information should match the checkmarks on the abstract and on Form 1.

Start/End Dates: Project may only be one year in length and may not have started before January of the previous year. Student should have competed in the first fair which was held after the end date. Fair dates can be found in the Find-a-Fair search.

Information regarding Research Site: This will tell you if you need additional paperwork. For example, Form 1C for RRI, Form 5A if animals at school, field, home, Form 5B if animals at RRI, no culturing of microorganisms is allowed at home (FTQ), Form 6A for BSL-1 & BSL-2 studies which must be in the appropriate facilities.

### **RESEARCH PLAN/POST PROJECT SUMMARY**

Review the research plan and post project summary to find information regarding each of the questions asked in previous section under Abstract. The Research Plan and Post Project Summary Instructions page lists the items that should be included. This needs to be very detailed and must be consistent with the documentation found on all other forms. If more information is needed about the study, the student or adult sponsor may need to be contacted (email, phone or interview).

Human Participants:

Look for information about subjects (any risk groups), recruitment, methods, risks & benefits, protection of privacy (HIPPA & FRPA), and informed consent (participant knows what they are being asked to do, that they may withdraw at any time, there is no coercion, etc.). Must have preapproval and often will require written consents. (Requires Form 4)

Is the level of risk appropriate? What risk assessment was done? Should the study have written Consent/Permission/Assent? Is the survey attached?

Animals:

Pay particular attention to the detailed procedures and care of the animals in the research and if they looked for alternatives to animal research. (Requires 5A or 5B and SRC or IACUC pre-approval)

Look for any potential FTQ items such as a study conducted at home, school or field that should have been done at an RRI, no indication of preapproval, any animal

deaths due to experimental procedures, weight loss  $\geq 15\%$  in any group or subgroup, toxicity studies, studies designed to kill, studies which cause more than momentary pain or suffering, predator/prey, inappropriate water or food restriction, euthanasia by student, etc. Ensure that an allowable embryonic study didn't hatch and become a vertebrate study that is not permitted.

### **PHBA's: (Potentially Hazardous Biological Agents)**

The source, quantity, and Biosafety Level (BSL) must be indicated for all microorganisms including established cell lines. All non-exempt microorganisms, cell lines, and tissues require SRC pre-approval, Form 6A and sometimes Form 6B.

Culturing of microorganisms may NOT be conducted at home. (FTQ) All BSL-1 studies must be conducted at a BSL-1 facility or higher. If a petri dish or culture container with unknown or BSL-2 microorganisms is opened, it becomes a BSL-2 study and may only be conducted at a BSL-2 facility. (FTQ if opened, subcultured, etc. in BSL-1 lab.) Most high school laboratories are BSL-1 facilities but it is possible that a high school could meet the more stringent requirements of a BSL-2 lab. BSL-3 or -4 studies, culturing CRE (Carbapenem Resistant Enterobacteriaceae), and studies designed to engineer bacteria with multiple antibiotic resistance are not permitted.

Procedures to minimize risk must be clearly indicated. rDNA studies require close review to ensure proper oversight. Proper disposal methods must be listed (autoclaving, 10% bleach solution/sodium hypochlorite, biosafety pick up, etc.).

Hazardous Chemicals, Activities, or Devices:

Look for detailed descriptions of risks and safety precautions and procedures used including methods of disposal.

### **APPROVAL FORM (1B)**

Dates: Signatures from student and parent should be before the start date shown on 1A.

Preapproval #2a: Must be signed by SRC or IRB before experimentation begins (Start date on 1A) for human, animal, and PHBA studies but possible FTQ if no preapproval is documented.

Postapproval #2b: SRC signs after experimentation ends (End date on 1A) if the study was conducted at a RRI. Institutional approval forms must also be submitted. (Possible FTQ)

Note: Some fairs will have the fair SRC pre-review a study before it is done at an institution, even if it is approved before experimentation by the institution, and then will also post-approve after the study is complete. They will therefore sign both boxes. Usually, however, it is either pre- or post-approval, not both.

Final SRC Approval: This is signed after the project is complete (End date Form 1A) and immediately before competition.

### **REGULATED RESEARCH INSTITUTION FORM (1C)**

The information provided by the scientist on this form must be consistent with what the student answered on other forms. It must not be filled out by the student. This form is posted so the judges can easily see exactly what the student did rather than what the mentor or others in the research group did. All information must be on the

form not “see attached.” This form may only be from a university, college, or industrial site and may not be from their high school.

Checkboxes a) and b) help determine who did what and where.

Questions:

1. “Have you reviewed the rules” helps determine the amount of oversight and if an error was made in following the rules, if this an adult problem or a student problem or both.

2. “Is this a subset of your work” helps differentiate student research from mentor research.

3. “How did student get idea” helps determine originality by student.

4. “Was student part of a research group” indicates whether student worked with another high school student, which is only allowed for team projects not individual, or was part of a larger team of adult researchers, undergraduate or graduate students, which is allowed. Students are judged only on their own work, so it needs to be clear what part of the study was done by the entire group or the mentor and what was the student’s work.

5-6. “What procedures” and “how independent” again help indicate what was actually done by the student.

Continuation: Frequently, the mentor will say “the student worked with me last year” or “in his previous research” or list dates of research which will indicate that the study must be treated as a continuation with Form 7, etc. It also could indicate that the study is too old, too long, or that the student is presenting multiple years of research.

This form is signed by the mentor AFTER the study is completed (End date on 1A).

## **QUALIFIED SCIENTIST FORM (2)**

Look for answers that are consistent with the information on other forms. For example, if the scientist marks yes to ‘used humans’ but other human subject forms aren’t present, will need to clarify. Any yes responses on #2 will require documentation on additional forms.

This form documents the amount of oversight that the student had and the safety precautions needed. The QS and DS review the study before the experiment begins. All approval signatures must be before research begins (Start date on 1A).

Even when not required, this form may be submitted to show the oversight of the study.

## **RISK ASSESSMENT FORM (3)**

Documents that both the student and the supervisor have assessed the risks involved in the research and describes what safety precautions and procedures are needed including the disposal procedures. This form is completed before experimentation (Start date on 1A).

This risk assessment is required for hazardous chemicals, activities, or devices, and for some PHBA's including protists, composting, coliform water test kits, decomposition of vertebrate organisms, etc.

Even when not required, this form may be submitted to show the oversight of the study.

#### **HUMAN SUBJECTS FORM (4)**

Make sure Form 4 is complete including decision checkmarks in the box and all 3 signatures. (If project is approved with expedited review, only one signature is required.) Missing checkmarks or signatures indicates no documentation of prior review and therefore could Fail to Qualify. All approval dates must be before research begins. (Start date on 1A.) The IRB should not include the adult sponsor, designated supervisor, qualified scientist or a relative (e.g. parent) of the student because of conflict of interest.

Research Plan: Refer to the research plan for subject information: any risk groups, recruitment, methods, risks and benefits, protection of privacy (HIPPA & FRPA), and informed consent (participant knows what they are being asked to do, that they may withdraw, no coercion, etc).

Risk Level: Is the level of risk marked appropriate? Was a risk assessment done? Should the study have written Consent/Permission/Assent? Is the survey attached?

#### **HUMAN INFORMED CONSENT FORM**

Does the form clearly explain what the participant is being asked to do, how long it will take, the potential risks and steps that will be taken to mitigate risk, the benefits to the participant or to society, how confidentiality will be maintained, that it is completely voluntary and that they may withdraw at any time.

Adult participants sign giving their consent, minors give their assent, and parents of participants give permission. All approval signatures must be before research begins (Start date on 1A).

#### **VERTEBRATE ANIMAL FORM (5A)**

Since these animals are not in a research institution, which would provide a high level of oversight, special attention must be paid to the housing and husbandry that will be provided by the student. The final disposition of the animals must also be appropriate. Any death, illness, or unexpected weight loss must have been investigated and documented by an attached letter from the QS, DS, or a veterinarian. If there were any deaths due to the experimental procedure, the project will Fail to Qualify.

All approval signatures must be before research begins (Start date on 1A). Capture & Release approvals must be attached when applicable.

#### **VERTEBRATE ANIMAL FORM (5B)**

Research which causes more than momentary pain or suffering is prohibited. Appropriate use of anesthetics, analgesics and/or tranquilizers must be documented. Any death, illness, or unexpected weight loss must have been investigated and documented by an attached letter from the QS, DS, or a veterinarian.

Euthanasia by student researchers is prohibited so the final disposition of the animals should also be indicated. If there were any deaths due to the experimental procedure, the project will Fail to Qualify.

If tissues were collected, how were they obtained and how will they be used.

The IACUC approval forms must be attached. They must clearly cover this study and must indicate that the study was approved before the start of the student research. Not all IACUC approval documentation will list the student individually, but the student research training must be indicated on the Form 5B. A letter from the QS or Principal Investigator indicating that the study had IACUC approval is not sufficient.

### **PHBA FORM (6A)**

Identification, Including Biosafety Level (BSL): The source, quantity, and BSL must be indicated. A plant or non-primate established cell line will not require Form 6A but the student may fill out this form in order to document that it is from ATCC, etc. However, human and other primate established cell lines and tissue cultures require Form 6A.

Prohibited Studies: BSL-3 or -4 studies, culturing CRE (Carbapenem Resistant Enterobacteriaceae), and studies which are designed to engineer bacteria with multiple antibiotic resistance are not permitted. (FTQ)

Site: Microorganisms may NOT be cultured at home. (FTQ) All BSL-1 studies must be conducted at a BSL-1 facility or higher. If a culturing plate with unknown microorganisms is opened, except for disinfection or disposal, it becomes a BSL-2 study and may only be conducted at a BSL-2 facility. FTQ if opened, subcultured, etc. in BSL-1 lab. Most high schools are BSL-1 facilities but it is possible that a high school could meet the more stringent requirements of a BSL-2 lab.

Risk Reduction: Procedures to minimize risk must be clearly indicated. rDNA studies require close review to ensure proper oversight.

Disposal: Proper disposal methods must be listed: autoclaving, bleach solution, biosafety pick up, etc.

Approval Dates: All approval signatures must be before research begins (start date on 1A.)

### **HUMAN AND VERTEBRATE ANIMAL TISSUE FORM (6B)**

Students may conduct tissue studies with tissue they are given from an IACUC approved study within a research institution but the animal may not be euthanized solely for the student's tissue study. The first checkbox in the signature box indicates this.

The second checkbox in the signature box is marked to indicate that the substances were handled in accordance with the safety standards for Blood Borne Pathogens.

All approval signatures must be before research begins (start date on 1A).

### **CONTINUATION FORM (7) Previous Year's Abstract & Research Plan**

This form is posted with the project so that the judges can tell at a glance exactly what was new and different about this year's study. All information must be on the form, not "see attached." Because research projects may only be 1 year's work, they will be judged on the current work only not on previous work, and this form is used

to document current versus previous research. Previous Intel ISEF projects can be found [here](#).

Frequently, students don't wish to call their project a continuation, but it's good research to continue a line of investigation even when the focus is now totally different. If the study is in the same field, if anything they learned in a previous year helped with the current study, or if the current study refers to any earlier research, then it is a continuation and Form 7 and previous abstract and research plan are required.

Repetition of a previous study that reflects no changes but simply retests or increases sample size is not permitted.

A longitudinal study, in which time is a critical variable, is permitted but the original data from previous years cannot be presented only the comparison between years.



# NSTF Scientific Review Committee (SRC) Review & Recommendation Report

Project Title: \_\_\_\_\_

Fair Division: [ ] Life [ ] Physical/Applied Category: [ ] Individual [ ] Team

Instruction: Please put a check [✓] in the appropriate column and if necessary, write recommendations on the space provided.

PART 1: REQUIRED FORMS FOR ALL RESEARCHES	Complete	Incomplete	Recommendations
1. Checklist for Adult Sponsor (1). Is it accomplished and signed?			
2. Student Checklist 1A. Is it complete and signed?			
If answer to item 5 is YES, must also have Form 7 (See Part II, item 13 below)			
If answer to item 7 is Research Institution or Other, must also have Form 1C (See Part II, item 6 below)			
3. Research Plan (Attachment to item 2, above). Does it include the following:			
A. RATIONALE. Does it include a synopsis of background information that supports the research problem and explains why the research is important scientifically? If applicable, does it explain the societal impact of the research?			
B. HYPOTHESIS(ES), RESEARCH QUESTION(S), ENGINEERING GOAL(S), EXPECTED OUTCOMES. Is this based on RATIONALE?			
C. RESEARCH METHODS AND CONCLUSIONS			
a. Procedures.			
i. Does it show all procedures and experimental designs, including methods for data collection?			
ii. There should be NO inclusion of work of mentor or others.			

iii. Parameters should NOT be too strict to allow for possible changes.			
b. Risk and Safety. Does it identify all potential risks and safety precautions needed?			
c. Data Analysis. i. Does it describe all procedures for data analysis? ii. Parameters should NOT be too strict to allow for possible changes			
D. <b>BIBLIOGRAPHY.</b> Does it have at least 5 major references? If using vertebrate animals, include 1 reference on animal care. (Chicago Manual of Style)			
<b>Note: Items 3.E-H are needed ONLY for researches on HUMAN PARTICIPANTS, VERTEBRATE ANIMAL, POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS (see attached Research Plan/Project Summary Instructions)</b>			
E. <b>HUMAN PARTICIPANTS RESEARCH.</b> Does it provide for the following? a. Description b. Recruitment c. Methods d. Risk Assessment e. Protection of Privacy f. Informed Consent Process			
F. <b>VERTEBRATE ANIMAL RESEARCH.</b> Does it provide for the following? a. Potential ALTERNATIVES to vertebrate animal use b. Potential impact or contribution of research c. Detailed procedures d. Detail animal numbers, strain, sex, age, source, etc. e. Describe housing and oversight of daily care f. Disposition of animals at study termination			



<p><b>G. POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS RESEARCH.</b> Does it provide for the following?</p> <ul style="list-style-type: none"> <li>a. Biosafety Level (BSL) Assessment and determination</li> <li>b. Source of agent, specific cell line.</li> <li>c. Safety precautions</li> <li>d. Methods of disposal</li> </ul>			
<p><b>H. HAZARDOUS CHEMICALS, ACTIVITIES and DEVICES.</b> Does it provide for the following?</p> <ul style="list-style-type: none"> <li>a. Risk Assessment process and results</li> <li>b. Chemical concentrations and drug dosages</li> <li>c. Safety precautions and procedures to minimize risks</li> <li>d. Methods of disposal</li> </ul>			
<p>4. Approval Form 1B (for ALL students)</p>			
<p>5. Abstract</p>			
<p><b>VERY IMPORTANT 2: See Part II, Risk Assessment (3) for</b></p>			
<ul style="list-style-type: none"> <li>a) Studies involving protists, archaea and similar microorganisms.</li> <li>b) Research using manure for composting, fuel production, or other non-culturing experiments.</li> <li>c) Commercially-available color change coliform water test kits. These kits must remain sealed and must be properly disposed.</li> <li>d) Studies involving decomposition of vertebrate organisms (such as in forensic projects).</li> <li>e) Studies with microbial fuel cells.</li> </ul>			

<b>PART 2: ADDITIONAL REQUIRED FORMS</b>	<b>Complete</b>	<b>Incomplete</b>	<b>Recommendations</b>
<p>6. <b>Regulated Research Institutional or Industrial Setting Form (1C).</b> Must be completed AFTER experimentation by the adult supervising the student research conducted in a regulated research institution or any work site aside from home, school or field. <b>Is it properly accomplished and signed by the DESIGNATED SUPERVISING ADULT?</b></p>			
<p>7. <b>Qualified Scientist Form (2)</b> – for researches with human participants, vertebrate animals, potentially hazardous biological agents, Drug Enforcement Administration (DEA)-controlled substances; completed and signed BEFORE start of experimentation.</p>			

<p><b>Is it properly accomplished and signed by the QUALIFIED SCIENTIST?</b></p>			
<p><b>8. Risk Assessment Form (3)</b> – for researches using hazardous chemicals, activities or devices and microorganisms exempt from pre-approval. Must be completed BEFORE experimentation. <b>Is it properly accomplished and signed by DESIGNATED SUPERVISING ADULT OR QUALIFIED SCIENTIST (when applicable)?</b></p>			
<p><b>9. Human Participants Form (4)</b> – for researches involving human participants not at a Regulated Research Institution. <b>Did the the DESIGNATED ADULT SUPERVISOR/ INSTITUTION approve the research BEFORE experimentation?</b></p>			
<p><b>10. Vertebrate Animal Form (5A)</b> – for researches involving vertebrate animals that is conducted in a school/home/field research site. <b>A. Is it properly accomplished, approved and signed by SRC BEFORE experimentation?</b>  <b>B. Is it properly accomplished, approved and signed by DESIGNATED VETERINARIAN BEFORE experimentation?</b>  <b>C. Is it properly accomplished, approved and signed by DESIGNATED SUPERVISOR OR QUALIFIED SCIENTIST (as applicable) BEFORE experimentation?</b></p>			
<p><b>11. Vertebrate Animal Form (5B)</b> – for researches involving vertebrate animals that is conducted at a Regulated Research Institution.  <b>A. Does it have IACUC approval BEFORE experimentation?</b>  <b>B. Is it properly accomplished, approved and signed by a QUALIFIED SCIENTIST/PRINCIPAL INVESTIGATOR?</b></p>			
<p><b>12. Potentially Hazardous Biological Agents Risk Assessment Form (6A)</b> – for researches involving microorganisms, rDNA, fresh/frozen tissue (including primary cell lines, human and other primate established cell lines and tissue</p>			

<p>cultures), blood, blood products and body fluids.</p> <p><b>A. Does it have SRC/IACUC/Institutional Biosafety Committee (IBC) approval BEFORE experimentation?</b></p> <p><b>C. Is it properly accomplished, approved and signed by a QUALIFIED or DESIGNATED SUPERVISOR BEFORE experimentation?</b></p> <p><b>D. Is it properly accomplished, approved and signed by the SRC BEFORE experimentation?</b></p>			
<p><b>E. Human Vertebrate Animal Tissue Form (6B) – for researches involving fresh/frozen tissue (including primary cell lines, human and other primate established cell lines and tissue cultures), blood, blood products and body fluids. If research involves living organisms, ensure that the proper human or animal forms are completed. All researches using any tissue listed above must also complete Form 6A. Is it properly accomplished, approved and signed by a QUALIFIED or DESIGNATED SUPERVISOR BEFORE experimentation?</b></p>			
<p><b>13. Continuation/Research Progression Projects Form (7) – for researches that are a continuation/progression in the same field of study as a previous research.</b></p> <p><b>A. This form MUST be accompanied by the PREVIOUS YEAR'S ABSTRACT and RESEARCH PLAN</b></p> <p><b>B. Is it properly accomplished, approved and signed by the student/s?</b></p>			

<b>PART 3: RESEARCH PAPER (See attached IMRAD Format)</b>		<b>Complete</b>	<b>Incomplete</b>	<b>Recommendations</b>
1. COVER PAGE A. Is the research title present? B. Is/Are the name/s of the student proponent's present? C. Is/Are the appropriate persons credited? (The Research adviser and Research Consultants, if applicable <b>MUST be present</b> )				
2. INTRODUCTION. Does it outline the research question and its significance within the topic discussed, making its relevance clear to readers in a CONCISE manner?				
3. METHOD. Does it clearly and comprehensively provide the reader with a description of the methods used in the research?				
4. RESULTS. Does it clearly and comprehensively SHOW the reader what the research came up with? This should be the MAIN section of the paper.				
5. DISCUSSION. Does this show what the findings in RESULTS mean?				
6. LIMITATIONS ON THE RESEARCH DESIGN AND MATERIAL. Does this show knowledge and understanding of research limitations?				
7. CONCLUSION, NOTES, WORKS CITED AND APPENDICES/BIBLIOGRAPHY A. Does the conclusion briefly and clearly analyze what the paper proposed, discussed and concluded? B. Is there in (MLA format) possible Researcher Notes, the research paper's Works Cited and possible appendices?				
<b>PART 4: RESEARCH ABSTRACT (MAX. 250 WORDS)</b>		<b>Complete</b>	<b>Incomplete</b>	<b>Recommendations</b>
1. Does it clearly and concisely state the PURPOSE OF THE RESEARCH?				
2. Does it clearly and concisely state the PROCEDURE/S undertaken in the RESEARCH				

3. Does it clearly and concisely state the DATA COLLECTED from the RESEARCH?			
4. Does it clearly and concisely state the CONCLUSIONS OF THE RESEARCH?			
<b>VERY IMPORTANT: There should be NONE of the following:</b> <ul style="list-style-type: none"> <li>a. Acknowledgements of the research institutions and/or mentors with which the student were working</li> <li>b. Self-promotions and external endorsements</li> <li>c. Inclusion of work or procedures done by the mentor</li> </ul>			

PART 5: RESEARCH LOGBOOK	Complete	Incomplete	Recommendations
1. Is the logbook intact and not tampered with? It should NOT be loose-leafed.			
2. Does the START DATE in the logbook match the START DATE in Student Checklist (1A)?			
3. Does the END DATE in the logbook match the END DATE in Student Checklist (1A)?			
4. Are all the entries in the logbook properly dated?			
5. Does the logbook show accurate and detailed notes and findings throughout the course of the research? Does it include data tables, and the like?			
6. Does the logbook show accurate and detailed description of procedures and processes conducted in the course of the research?			
7. Does the logbook show student notes and questions in the course of the research?			

☐ Qualified    ☐ Disqualified    Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Reason/s for Disqualification: \_\_\_\_\_



# NSTF Board of Judges (BOJ) Project Evaluation Form

Title of Research Project: \_\_\_\_\_

Project Proponent/s: \_\_\_\_\_

School: \_\_\_\_\_

Project Category: ( ) Life Science ( ) Physical Science

( ) Team ( ) Individual

Category	Score
<p><b>1. Creative Ability (30)</b></p> <p>1. Does the project show creative ability and originality in the:</p> <p>a. questions asked?</p> <p>b. approach to solving the problem?</p> <p>c. analysis of the data?</p> <p>d. interpretation of the data?</p> <p>e. use of equipment?</p> <p>f. construction or design of new equipment</p>	
<p>2. Creative research should support an investigation and help answer a question in an original way.</p>	
<p>3. A creative contribution promotes an efficient and reliable method for solving a problem. When evaluating project, it is important to distinguish between gadgeteering and ingenuity.</p>	
<p><b>2. Scientific Thought (30)</b></p> <p>(If an engineering project, please see 2b. Engineering Goals.)</p> <p>1. Is the problem stated clearly and unambiguously?</p> <p>2. Was the problem sufficiently limited to allow plausible attack? Good scientists can identify important problems capable of solutions.</p> <p>3. Was there a procedural plan for obtaining a solution?</p> <p>4. Are the variable clearly recognized and defined?</p> <p>5. If controls were necessary, did the student recognize their need and were they used correctly?</p> <p>6. Are there adequate data to support the conclusions?</p> <p>7. Does the finalist/team recognize the data's limitations?</p> <p>8. Does the finalist/team understand the project's ties to related research?</p> <p>9. Does the finalist/team have an idea of what further research is warranted?</p> <p>10. Did the finalist/team cite scientific literature, or only popular literature (e.g. local newspapers, magazines)?</p> <p><b>b. Engineering Goals</b></p> <p>1. Does the project have a clear objective?</p> <p>2. Is the objective relevant to the potential user's needs?</p> <p>3. Is the solution: workable? Acceptable to the potential user? Economically feasible?</p> <p>4. Could the solution be utilized successfully in design or construction of an end product?</p> <p>5. Is the solution a significant improvement over previous alternatives or application?</p> <p>6. Has the solution been tested for performances under the conditions of use?</p>	

<p><b>3. Thoroughness (15)</b></p> <ol style="list-style-type: none"> <li>1. Was the purpose carried out to completion within the scope of the original intent?</li> <li>2. How completely was the problem covered?</li> <li>3. Are the conclusions based on a single experiment or replication?</li> <li>4. How complete are the project notes?</li> <li>5. Is the finalist/team aware of other approaches or theories?</li> <li>6. How much time did the finalist or team spend on the project?</li> <li>7. Is the finalist/team familiar with scientific literature in the studied field?</li> <li>8. Are the relevant details (<i>including the pages and dates</i>) of the experiment recorded in the research data logbook?</li> </ol>	
<p><b>4. Skill (15)</b></p> <ol style="list-style-type: none"> <li>1. Does the finalist/team have the required laboratory, computation, observational and design skills to obtain the supporting data?</li> <li>2. Where was the project performed (i.e. home, school laboratory, university laboratory) Did the student or team receive assistance from parents, teachers, scientists or engineers?</li> <li>3. Was the project completed under adult supervision, or did the student/team work largely alone?</li> <li>4. Where did the equipment come from? Was it built independently by the finalist or team? Was it obtained on loan? Was it part of a laboratory where the finalist/team worked?</li> </ol>	
<p><b>5. Clarity (10)</b></p> <ol style="list-style-type: none"> <li>1. How clearly does the finalist or team discuss his/her/their project and explain the purpose, procedure, and conclusions? Watch out for memorized speeches that reflect little understanding of principles.</li> <li>2. Does the written material reflect the finalist's or team's understanding of the research?</li> <li>3. Are the important phases of the project presented in an orderly manner?</li> <li>4. How clearly is the data presented?</li> <li>5. How clearly are the results presented?</li> <li>6. How well does the project display explain the project?</li> <li>7. Was the presentation done in a forthright manner, without tricks or gadgets?</li> <li>8. Did the finalist/team perform all the project work, or did someone help?</li> </ol>	
<p><b>TOTAL</b></p>	
<p>Signature Over Printed Name of Judge</p>	