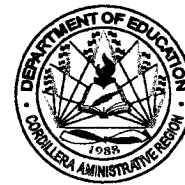




Republic of the Philippines
Department of Education
CORDILLERA ADMINISTRATIVE REGION
Wangal, La Trinidad, Benguet



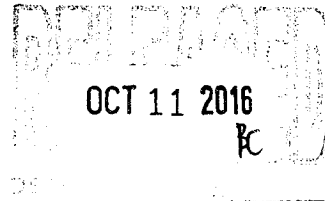
REGIONAL MEMORANDUM

NO. 296 - 2016

To : **Schools Division Superintendents**
All Divisions

From : **FOR THE REGIONAL DIRECTOR**

SORAYA T. FACULO
Chief Education Supervisor
Officer – In – Charge
Office of the Assistant Regional Director



Subject : **2016 REGIONAL SCIENCE AND MATHEMATICS FESTIVAL**

Date : **October 11, 2016**

1. The DepEd-CAR through the Curriculum and Learning Management Division, in coordination with the Math and Science Teachers Organizations will conduct the 2016 Regional Mathematics and Science Festival on November 23-26, 2016 at **Abra High School, Bangued, Abra** with the Theme: **"Juan Science, Juan Math, One Nation"**.
2. This annual academic competition aims to promote Mathematics and Science and Technology consciousness among the youth and identify the most creative/innovative and the best Science and Technology researchers who will represent the region to the National Science and Technology Fair. The schools are encouraged to promote Science, Technology investigatory projects and Mathematics investigations that will explore innovations & ingenuity and engage in lively fora & discussions.
3. The competed events are the following:

I. SCIENCE EVENTS

EVENTS CONTESTED	CATEGORY / LEVEL	NUMBER OF PARTICIPANTS/EVENTS
A. Science Investigatory Project		
1. Elementary	Individual	5 projects per division
	Team (Minimum of 2 maximum of 3 members)	5 projects per division
2. Junior High School	Life Science Team and Individual	5 projects per division per category Total of 10 projects
	Physical Science Team and Individual	5 projects per division per category Total of 10 projects
B. Science Quiz		
1. Elementary	Grade 3 to Grade 6	1 first placer per grade level
2. Junior High School	Grade 7 to Grade 10	1 first placer per grade level
C. Strategic Intervention Materials		
1. Teachers Category	Grade 3 to Grade 6	1 first placer per grade level
	Grade 7 to Grade 10	1 first placer per grade level
D. Sci-Dama		
1. Water Patrol	Grade 3 and 4	1
2. Power Patrol	Grade 5 and 6	1
3. Electro-Scidama	Grade 7	1
4. Sci-Not Scidama	Grade 8	1
5. THI Scidama	Grade 9	1
6. Thermo-Scidama	Grade 10	1

Telephone Numbers:

Office of the Director IV	-422-1318	Budget and Finance Division	-422-5155	Cash Section	-309-3017	Record Section	-309-3015
Fax Machine	-422-4074	Elementary Education Division	-422-7096	Physical Facilities Unit/ICT	-309-3011	Payroll Services Unit	-424-3993
Office of the Director III	-309-3013	Alternative Learning System	-422-5187	Regional Planning Unit	-309-1234	Special Services Division	-424-5167
Administrative Division	-422-1804	Secondary Education Division	-309-3014	Supply Unit	-422-2198	Commission on Audit	-422-7434

II. MATHEMATICS EVENTS

EVENTS CONTESTED	CATEGORY/LEVEL	NUMBER OF PARTICIPANTS/EVENTS
A. Damath Elementary		
1. Whole Number Damath	Grades 3 or 4	1
2. Positive Fraction Damath	Grades 5 or 6	1
B. Damath Junior High School		
1. Integer Damath	Grade 7	1
2. Signed Fraction Damath	Grade 8	1
3. Radical Math	Grade 9	1
4. Polynomial Damath	Grade 10	1
C. Mathematics Quiz Elementary		
1. Written	One only from Grades 4,5 & 6	1 first placer per grade level
2. Oral	One each from Grades 4, 5, & 6	1
D. Mathematics Quiz Junior High School		
1. Written	One only from Grades 7, 8, 9 & 10	1 first placer per grade level
2. Oral	One each from Grades 7, 8, 9 & 10	1
E. Strategic Intervention Materials		
1. Teachers Category	Elementary	2 projects
	Junior High School	2 projects
F. Mathematics Investigation		
	Junior High School only	
1. Regular/Science Class	Individual Category	3 projects
2. Regular/Science Class	Team Category	3 projects (3 or 2 per team)

Note:

- The use of calculator is allowed only in Damath and Scientific Notation Scidama.
 - There shall be different participants for the individual and team categories.
 - Strategic Intervention Materials that passed the Regional Quality Assurance shall not be qualified as entry to the Strategic Intervention Materials Category in the Math & Science Fair but this can be used as intervention to Action Researches.
 - Submit three (3) copies each of Strategic Intervention Materials (SIM), Science Investigatory Projects (SIP) and Mathematics Investigation (MI) for (3) judges to the Curriculum and Learning Management Division (CLMD) on or before November 4, 2016 at 5:00 P.M. . Projects received after the said date will not be included in the judging.
 - Test questions will be properly endorsed by the Schools by the Schools Division Superintendents (SDS). Submission of the questions will be on or before November 11, 2016 at 5:00 P.M. to the Regional Office.
4. Points system will be applied to determine the over-all ranking of the divisions. 1st place 10 points; 2nd place 8 points; 3rd place 6 points; 4th place 5 points; 5th place 4 points; 6th place 3 points; 7th place 2 points and 8th place 1 point.
 3. The Mechanics and Guidelines of the competitions are found in Enclosure number 1. Enclosure number 2 is the composition of the people involved and the Technical Working Group (TWG) of the said activity. Enclosure 3 is the National Science and Technology Fair Guidelines.
 4. Participants shall be charged a registration fee of Php 550.00 to cover administrative cost, honorarium of judges, extra essential services, and other incidental expenses. **Meals and snacks shall be handled by each schools division offices.** All expenses relative to the conduct of this activity shall be charged against available local funds and other sources subject to the usual accounting and auditing rules and regulations. Participants are requested to bring their sleeping paraphernalia and personal amenities.
 5. Expected arrival of Division delegates is on November 23, 2016 at 1:00 P.M. onwards. A coordination meeting of the Management and Working Committees will be held at Abra High School on November 23, 2016 at 4:00 P.M.
 6. Parade will start at 8:00 in the morning of November 24, 2016 followed by opening program.
 7. All delegates must wear their uniform with the prescribed color as agreed upon during the coordination meeting. The colors per division is as follows:

Apayao – Green	Ifugao - Violet
Abra – Orange	Mountain Province - Pink
Baguio City – Yellow	Kalinga - White
Benguet – Blue	Tabuk - Red
 8. Post conference on the conduct of the festival will be held in the afternoon of November 25, 2016 after the awarding ceremonies.
 9. Immediate and wide dissemination of this Memorandum is advised.

Guidelines and Mechanics for the Different Festival Competition.

A. Regional Science Investigatory Projects and Mathematics Investigation

1. Science Research Competition

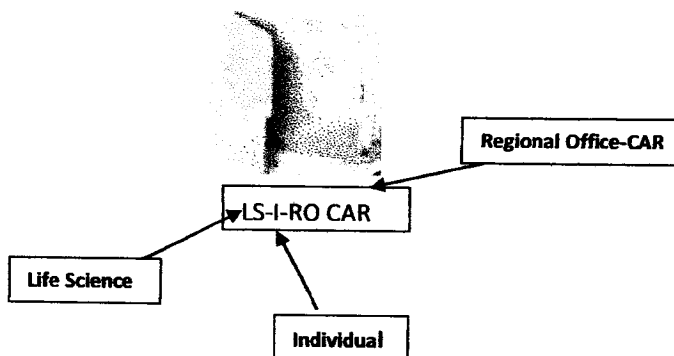
- a. Below are the classifications and categories of the science research for the **Junior High School Level**.
- b. **Classification for the Science Investigatory projects are as follows:**

<p>Entries shall come from the eight divisions in CAR and the Regional Science High School (CRSHS) will be treated as one Division (for SIP only) , while the Philippine Science High School (PSHS) projects shall go directly to National Screening.</p>			
<p>Life Science Junior High Level</p>		<p>Physical Science Junior High Level</p>	
<p>Individual Project</p>	<p>Team Project</p>	<p>Individual Project</p>	<p>Team Project</p>
<p>Elementary Level</p>			
<p>Individual Project</p>		<p>Team Project</p>	

For more details on project category ideas please visit
www.societyforscience.org/isef/students/project_categories

The Division level **top five** projects for each category will participate in the regional competition.

There will be four (4) Regional Level **first place** winners in the Life and Physical categories to represent the region to the National Science and Technology Fair at a venue to be announced later. The **national participants** (Regional first place winners) shall arrange their projects based on the following example in soft copies to be submitted to the Region **November 30, 2016** to be submitted to NSF Screening Committee:



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

- c. The Regional Science Research competition for the **elementary level** will be in two categories the **Individual and Team categories**. Projects will no longer be classified as life science or physical science. The top five projects (no ties) in the Division level will participate in the regional competition.

The Science Research Project

Science research projects must conform with international rules published by the *Intel International Rules for Pre-college Science Research: Guidelines for Science and Engineering Fairs 2016*. Each project is expected to have a Research Adviser and an Institutional Review Board (IRB) or a Scientific Review Committee (SRC).

For the National Level, the research project should cover a maximum of twelve (12) continuous months from January 2015 to December 2015. However, since the National STF is in the first week of February, then the complete write-up should have been submitted to the **National SRC by November 30, 2016**. The first placers in the Regional Level for every category will be screened to fulfill the national requirement for National S&T Competitions: *The participation of schools in the National STF shall be clustered into two types, Life Science and Physical Science. All Math – related projects shall join in the Physical Science Category.* Thus only four projects shall move to the National STF.

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 for the competition.

B. Guidelines of Math and Science Quiz

The Math Quiz will be composed of Easy (to be solved mentally), Average, and Difficult questions to be answered with a written solution in papers to be distributed during the event. "Clincher" or "Do or Die" questions will be given in case of ties. Science Quiz will be composed of Easy, Average (in multiple choice type) but not for the Difficult and Clincher questions.

Subject Area	Easy	Average	Difficult	Clincher/Do or Die
Math	15 seconds	30 seconds	60 seconds	To be announced by the Quiz Master
Science	10 seconds	15 seconds	30 seconds	

For Math Quiz: One representative for Grades 4, 5 & 6 (Elementary) and one Representative for Grades 7, 8, 9 & 10 (Junior High School) will be in written form while the other will be orally.

- a. The regional Math (Orals) and Science Quiz shall be conducted in a Quiz show format wherein all contestants are seated facing the stage while the other Math quiz shall be in written.
- b. There shall be Easy, Average, and Difficult rounds of five (5) questions per category. Each correct answer for the Easy round is given two (2) points, Average round three (3) points, and Difficult round five (5) points. In case of tie/s, clinchers / Do or Die questions will be given until the tie is broken. Each contestant will be given answer sheets to write their answers.
- c. Questions will be drawn from the question box per category by the judges to be validated before it will be given to the Quiz Master.
- d. The Quiz Master will read the question twice. After the second reading, the Quiz Master will say "GO" and the time starts and the contestants begins to write his/her answer. The buzzer sounds after the given time limit and the contestants will raise their answers for recording and verification by the proctors and Board of Judges.
- e. If the proctor cannot determine the validity of the answer, the Board of Judges will decide on the matter. The decision of the board of judges is final.
- f. The duly registered contestant is only the authorized person to make a protest. **All protests should be referred to the board of judges before the Quiz Master reads the next question.** No protests will be entertained after the Quiz Master has read the next question.
- g. Coaches will not be allowed inside the quiz room but they will be asked to validate some queries/questions from the contestants.
- h. Any violation of the aforementioned rules shall cause the disqualification of the contestant/s concerned

C. DAMATH / SCIDAMA RULES

1. Set the starting positions of the chips.
2. The two players alternately will take turns in moving a piece (pass is not allowed).
3. Touch move shall be observed in the games. A player who touches a chip is required to move that chip unless it is an illegal move.
4. After making a move, a player shall record his/her move in the scoresheet.
5. Only one scoresheet will be used by the players in a game.
6. Each player is allowed one minute to move, record the move and score.
7. A warning is given to a player by the arbiter if no move is made in one minute consequently, is forced to move a chip.
8. Continuous violation of rule #7 will mean disqualification (after 3 warnings) of the player regardless of their scores.
9. All moves should be in the forward direction except when taking a chip or the chip is "dama".
10. A chip is declared "dama" if it reaches and stops in any of the following opponent's square:
(1,0) (3,0) (5,0) (7,0)
- Similarly, if an ordinary opponent's chip reaches the following squares, it is declared as "dama".
(0,7) (2,7) (4,7) (6,7)
11. Once a piece/chip is declared as a "dama", it could slide diagonally forward or backward in any vacant square. If a "dama" takes a chip, the score is doubled, similarly if a chip takes a "dama" the score is also doubled. If the "dama" takes a "dama", the score is quadrupled.
12. In taking chip/chips, the following shall prevail:
"Mayor dama"
"Mayor dalawa"
"Mayor tatlo" , etc.
13. "Dama" chip should be encircled in the score sheet to identify the "dama".
14. Games duration should not exceed twenty minutes.
15. The game also ends if:
 - The moves are repetitive
 - A player has no more chips to move
 - A player has no more chips
 - A player resigns.
- "Saved by the bell"* is not applicable in the end game. Continuation of the move shall be enforced when taking a chip/s.
16. The remaining chip/s of a player is/are added to his total score algebraically.
17. If the remaining chip is a "dama", the value is doubled.
18. The player with the greater total score wins the game, except in the sci-dama when the player with lesser score wins.
19. Only players are allowed to raise questions during the game through the arbiter and questions should be settled immediately. No questions will be entertained after the game.
20. Arbiter's decision is final.

C. CRITERIA FOR STRATEGIC INTERVENTION MATERIAL

1. Sub-tasking
 - a. Competency-based
 - b. Bloom's Taxonomy followed
 - c. SMART objectives
2. Congruence
 - a. Activities in line with content and skills
 - b. Assessment in line with content and skills
3. Usability and Functionality
 - a. Language
 - b. Title Card
 - c. Guide Card
 - d. Activity Card
 - e. Assessment Card
 - f. Enrichment card
 - g. Reference Card
 - h. Answer Card
 - i. Packaging
4. Replicability
 - a. Validated before classroom use
 - b. Development of materials based on least learned competencies
 - c. Materials used improved mastery level
 - d. Cost effectiveness

Reminder: (Mathematics)

For the Strategic Intervention Materials (SIM) for students with learning difficulty in a certain competency

1. The write-up should be present, the evidence that is a least learned competency. Thus, the material is needed. The competency to be addressed should be stated.
2. The write-up and the Strategic Intervention Material (SIM) project should be packaged as one.
3. The certification of the school head that is has been used in the school.
4. The Title Card, Guide Card, Activity Card, Assessment Card, Enrichment Card, Reference Card and Answer Card should be in separate pages.
 - Each activity should be in separate page so with its answer card
 - Reference Card can bear the reference/s or the needed Math concepts that the students should know (something that they can refer to)
 - Pictures used should be found in the locality (contextualized)
 - Color blending and fonts should be considered
5. Others can be found in the criteria

CRITERIA FOR MATHEMATICS INVESTIGATION

1. Use of Notation and Terminology
 - Use appropriate notation and terminology in a consistent manner and does so throughout the work
2. Searching for Patterns
 - Use a mathematical strategy to produce and organize data gathered.
 - Test/s the validity of the general statement by considering further examples
3. Communication
 - Provide/s complete, coherent explanations or arguments, and communicates them clearly using appropriate forms of representation
4. Generalization
 - Correctly produce/s a general statement that is consistent with the patterns and/or structures generated
 - Express/es the correct general statement in appropriate mathematical terminology
 - Correctly state/s the scope or limitations of the general statements
 - Give/s a correct, formal proof of the general statement
5. Use of Technology
 - Make/s full and resourceful use of calculator or computer in a manner that significantly enhances the development of the task
6. Quality of Work
 - Shown an outstanding quality of work

Technical Working Group

Function/ Event	Elementary	Secondary
Strategic Intervention Materials in Science	Jane Butale	Efren Matthew de Peralta
Elementary Science Investigatory Project	Beatriz Domong-as Jesusa Biggayan (Team)	Adoracion Tombali Cresencia Naoy (Individual)
Secondary Physical Science	Denia Wacnag (Team)	Gloria Codamon (Individual)
Secondary Life Science	Wanda Lyn Pladio (Team)	Divina Mendoza (Individual)
Chief Arbiter (Scidama)	Mark Binay-an	Darwin Paas
Arbiters	Reynaldo Tumapang	Dexter Martinez
	Richard Simsim	Clarence Binwag
	Donald Lid-ayan	Allan Litaoen
	Leonardo Egan	Jovy Rose Abuda
	Vincent Depayso	Amor Parista
		Max Dumayas
Strategic Intervention Materials in Mathematics	Jonathan Batara	Harold Moncion
Mathematics Investigation (Team and Individual)	Noble Marissa Dominga (Team)	Luisita Parilla (Individual)
Tournament Manager (Damath)	Wilfred C. Bagsao	Francisco B. Copsiyan
Chief Arbiter (Damath)	Ryan Espinosa	Gilbert Cherweg
Arbiters	George Vidal	Robert Pocdihon
	Jomar Brub	Limson Dumogo
	Maricel Enciso	Joel Tullias
	Samel Dales	Jonathan de la Cruz
	Joemar Soriano	Eljun Arisga
Quiz Master (Mathematics Quiz Bee)	Dolores Anecang	Rolly Pascua
Judge (Mathematics Quiz Bee)	Lydia Belingon	Limuel Dickson
Proctor (Mathematics Quiz Bee)	Silverio W. Tawatao	Emmanuel Uboan
Overall Consolidators	Warly Kindiawan	Laureen B. Likigan
Monitoring and Evaluation	Clemente Bandao	Florence Balictan

Note:

TWG should be guided by the guidelines for each event and facilitating of immediate returns of results for tallying.

**2016 Science and Math Festival
Pool of Judges**

SECONDARY		
LIFE SCIENCE	TEAM	INDIVIDUAL
	Dr. Apler S. Bansiong	Mr. Nero M. Paderes
	Dr. Lloyd V. Orduña	Ms. Jasmin L. Donaal
	Dr. Rosemary M. Gutierrez	Dr. Teodora D. Balangcod
PHYSICAL SCIENCE	Mr. Vicente A. Ato	Dr. Wilfred B. Bambico
	Dr. Quantum Yuri B. Lubrica	Engr. Petra Cadawan
	Dr. Debbie Glen V. Manangkil	Dr. Norberto Cobaldez
ELEMENTARY	Dr. Manolita Alvaro	Ms. Criselda Battad
	Ms. Victoria Dulinayan	Ms. Sheila Marie Singa-Claver
	Engr. Keith Jimson Mangusan	Dr. Ronal Ocampo
STRATEGIC INTERVENTION MATERIALS –Teachers’ category	Elementary	Secondary
Science	Dr. Lilia B. Goc-oban	Dr. Ethelyn Taqued
	Crisanta Pantaleon	Ms. Emilia Faustino
	Ms. Jeannie Claire Piggangay	Ms. Felina Espique
Mathematics	Elementary and Secondary	
	Dr. Rosemarie Daytec	
	Michelle D. Dicang	
	Marlon Y. Palbusa	
Math Investigation		
	Pio Ecuán	
	Bryan A. Hidalgo	
	Reymart Lagunero	

Enclosure # 3 Regional Memorandum _____s, 2016

National Science and Technology Fair Guidelines

1. Levels of Competition

School/Division Level

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

- Checklist for Adult Sponsor
- Student Checklist (1A)
- Research Plan (NOTE: No need to attach the Research Plan Instructions)
- Approval Form (1B)
- Regulated Research Institutional/Industrial Setting Form (1C)

3. FORMS depending on the type of research (e.g involving humans, vertebrate animals, hazardous chemicals, etc.)

- Qualified Scientist Form (2)
- Risk Assessment Form (3)
- Human Participants Form (4)
- Human Informed Consent Form
- Vertebrate Animal Form (5A)
- Vertebrate Animal Form (5B)
- Potentially Hazardous Biological Agents Risk Assessment Form (6A)
- Human and Vertebrae Animal Tissue Form (6B)
- Continuation Project Form (7)

4. Abstract (Maximum of 250 words)

The abstract should include the following:

- Purpose of the experiment
- Procedure
- Data conclusion
- The abstract may NOT include the following:
 - Acknowledgement
 - 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 #8)

7. Scanned copy of the log book

Project of proponents should have been screened by the IRB/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 BOJs who shall determine the school/division winners of the different categories and fair divisions.

Winners at the school level should be officially endorsed to the Division for the division level. Likewise, the division level winners should be officially endorsed to the region.

Regional Level

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

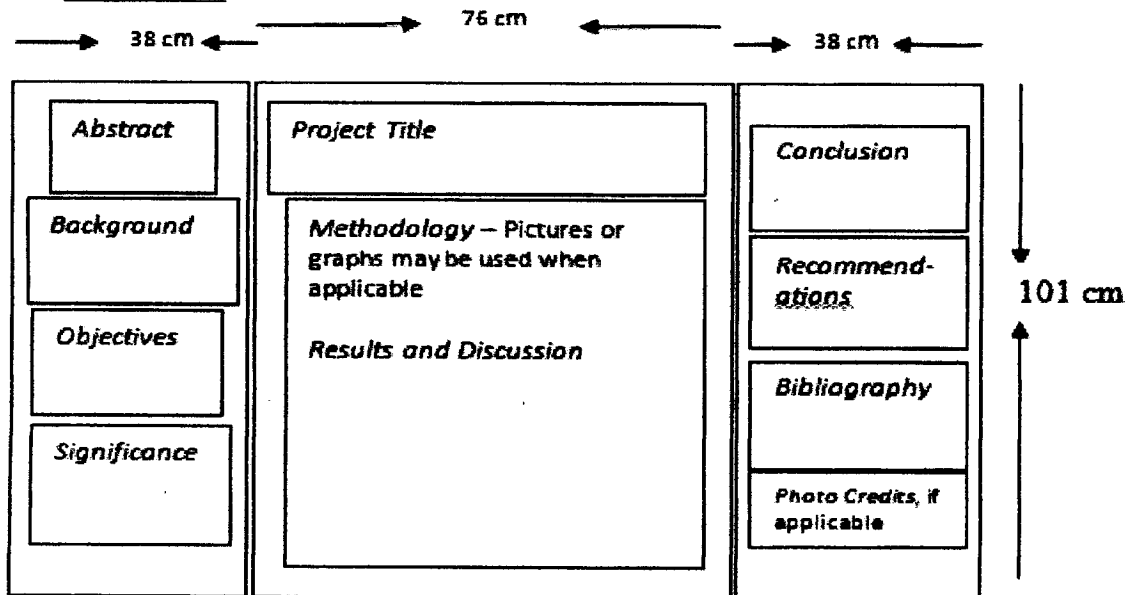
The Official List of the first place winners at the regional level, report on the conduct of S&T Fair, soft copies of the manuscripts and other necessary documents shall be officially endorsed by the Regional Office to DepEd Central Office through the Bureau of Secondary Education. The soft copies must be saved in the CD containing 4 folders representing the four categories. Each folder must contain the manuscripts in PDF Format and another folder containing all the required forms including the scanned copies of the research logbook.

2. The Research Project

Science research projects must conform with international rules published by the *Intel International Rules for Pre-college Science Research: Guidelines for Science and Engineering Fairs 2015-2016*. 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 2015 to December 2015.

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 for the competition.

3. The Exhibit



3.1 Display and Safety Regulations

The project display using sets of any paper or board 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 Regional level as well as in the National STF in support of the environmental advocacy of the government in reducing the consumption of non-biodegradable or non-recyclable materials. Use illustration boards and size should follow the measurement given in this memorandum.

The safety regulations that must be adhered to should be consistent with the guidelines found on page 23 of the ISEF guidelines (<http://www.societyforscience.org/isef/rulesandguidelines>).

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 that a proponent should **not** include his/her face in the project's procedure/illustration in the display.*

3.2 Requirements for presentation by the Project Proponent/s to the BOJs 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: <http://www.societyforscience.org/document.doc?id=12>)

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. These rules can be found in the Guidelines (<http://www.societyforscience.org/isef/rulesandguidelines>) and in the Student Handbook (<http://www.societyforscience.org/document.doc?id=12>).

- 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 you will use 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. **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.

 - 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:** The introduction sets the scene for your report. The introduction includes the purpose, your hypothesis, problem or engineering goals, an explanation of what prompted your research, and what you hoped to achieve.
 - c) **Materials and Methods:** Describe in detail the methodology you used to collect data, make observations, design apparatus, etc. Your research paper should be detailed enough so that someone would be able to repeat the experiment from the information in your paper. Include detailed photographs or drawings of self-designed equipment. Only include this year's work.
 - d) **Results:** The results include data and analysis. This should include statistics, graphs, pages with your raw collected data, etc.

- e) **Discussion:** This is the essence of your paper. Compare your results with theoretical values, published data, commonly held beliefs, and/or expected results. Include a discussion of possible errors. 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:** Briefly summarize your results. State your findings in relationships of one variable with the other. Support those statements with empirical data (one average compared to the other average, for example). Be specific, do not generalize. Never introduce anything in the conclusion that has not already been discussed. Also mention practical applications.
- g) **Acknowledgements:** You should always credit those who have assisted you, including individuals, businesses and educational or research institutions. However, acknowledgments listed on a project board are a violation of D & S Display rules and must be removed.
- h) **References/Bibliography:** Your reference list should include any documentation that is not your own (i.e. books, journal articles, websites, etc.). See an appropriate reference in your discipline for format or refer to the Instructions to Authors of the appropriate publication.

Three common reference styles are:

1. **APA (American Psychological Association) Style :**
 - [-http://apastyle.apa.org/](http://apastyle.apa.org/)
 - [-http://www.calvin.edu/library/knightcite/index.php](http://www.calvin.edu/library/knightcite/index.php)
 - [-http://owl.english.purdue.edu/owl/section/2/10/](http://owl.english.purdue.edu/owl/section/2/10/)
 - *This resource offers examples for the general format of APA research papers, in-text citations, endnotes/footnotes, and the reference page.*

MLA (Modern Language Association) Format:

- [-http://www.mla.org/style](http://www.mla.org/style)
- [-http://www.calvin.edu/library/knightcite/index.php](http://www.calvin.edu/library/knightcite/index.php)
- [-http://owl.english.purdue.edu/owl/section/2/11/](http://owl.english.purdue.edu/owl/section/2/11/)
- *This resource offers examples for the general format of MLA research papers, in-text citations, endnotes/footnotes, and the Works Cited page.*
- **The Chicago Manual of Style:**
- <http://www.chicagomanualofstyle.org/home.html>
- [-http://www.calvin.edu/library/knightcite/index.php](http://www.calvin.edu/library/knightcite/index.php)

The Chicago Manual of Style presents two basic documentation systems. The more concise author-date system has long been used by those in the physical, natural, and social sciences. In this system, sources are briefly cited in the text, usually in parentheses, by author's last name and date of publication. The short citations are amplified in a list of references, where full bibliographic information is provided.

2. **Abstract:**

After finishing research and experimentation, an abstract should be written. This needs to be a maximum of 250 words on one page. It should include the a) purpose of the experiment, b) procedures used, c) data, and conclusions. It also may include any possible research applications. Only minimal reference to previous work may be included. The abstract must focus on work done in the current year and should not include a) acknowledgments, or b) work or procedures done by the mentor. See below for examples of award winning abstracts. See page 28 of the International Rules for the proper formatting of an Official Intel ISEF Abstract and Certification. Please Note: The official abstract form is only for those participating in ISEF. This form may not be required for other levels of competition.