Republic of the Philippines
Department of Education
DepEd Complex, Meralco Avenue, Pasig City

AUG 2 4 2011

DepEd MEMORANDUM
No. 190 , s. 2011

SCIENCE AND TECHNOLOGY FAIR FOR 2011-2012

To: Undersecretaries
Assistant Secretaries
Bureau Directors
Regional Directors
Schools Division/City Superintendents
Heads, Public and Private Secondary Schools

1. The Department of Education (DepEd), through the Bureau of Secondary Education (BSE), announces the conduct of the regional and national levels of **Science and Technology Fair 2011-2012** on the following dates:

Level	Date
Regional	September 10-11, 2011
National	October 26-29, 2011

2. The Science and Technology Fair aims to:

a. promote science and technology consciousness among the youth; and
b. identify the most creative and the best science researchers who will represent the country in the Intel International Science and Engineering Fair.

3. The schools are encouraged to promote science investigatory projects that will address the *environmental protection and conservation of the ecosystem.* The special awards will be given to deserving projects.

4. The participants in this activity are students from both public and private secondary schools.

5. For reference, please see the following enclosures:

Enclosure No. 1 - Implementing Guidelines;
Enclosure No. 2 - Schematic Diagram on the Flow of Events;
Enclosure No. 3 - 2011 Calendar of Important Science Fair Activities and Requirements;
Enclosure No. 4 - Format of Research Paper;
Enclosure No. 5 - List of Regional Coordinators;
Enclosure No. 6 - Data on the Number of Participants from each region; and
Enclosure No. 7 - ISEF 2010 International Rules and Guidelines.

6. The Regional Coordinators listed in Enclosure No. 5 are requested to submit to BSE (Attn.: Ms. Elizabeth G. Catao/Mr. Nick M. San Gabriel Jr.) reports using the formats in Enclosure No. 6 on the following dates:

Level	Date
School	September 19, 2011
Division	September 19, 2011
Regional	October 5, 2011

In addition, the Regional Offices are requested to officially inform the BSE of any changes of the assigned Regional Coordinators as soon as possible.

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

Level	Participant	Registration Fee
Division	- Students with entries - Adviser - Supervisor • Science • Mathematics	PhP2,000.00
Regional		PhP4,500.00

This registration fee shall be charged to local funds subject to the usual accounting and auditing rules and regulations. This will cover prizes, board and lodging of participants and their advisers, Science and Mathematics supervisors, and the materials needed to the conduct of the Science and Technology Fair. The subsidy to cover the payment for honoraria of the members of the Scientific Review Committee (SRC) and Board of Judges (BOJ) relative to the conduct of Regional Level Science and Technology Fair shall be downloaded to the regions.

8. All other activities relative to science and mathematics including those of the private associations are required to be integrated with the activities of the Science Fair in October 2011.

9. For more information, please contact **Ms. Elizabeth G. Catao** or **Mr. Nicanor M. San Gabriel, Jr.**, BSE-Curriculum Development Division (CDD), 3rd Floor, Bonifacio Bldg., DepEd Complex, Meralco Avenue, Pasig City at telephone no.: (02) 632-7746.

10. Immediate dissemination of this Memorandum is desired.

BR. ARMIN A. LUISTRO FSC
Secretary

Encls.: As stated
Reference: DepEd Memorandum: Nos. 310 and 325, s. 2010
To be indicated in the Perpetual Index
under the following subjects:

CONTESTS
SCIENCE EDUCATION
SCHOOLS
STUDENTS

R-MCR/DM-Science and Technology Fair
Agust 17, 2011

(Enclosure No. 1 to DepEd Memorandum No. 190, s. 2011)

SCIENCE & TECHNOLOGY FAIR IMPLEMENTING GUIDELINES

The Science Fair

The Bureau of Secondary Education, Department of Education (BSE-DepEd) shall conduct this year's Science Fair on October 26-29, 2011.

The activity is a nationwide science research competition that aims to promote science and technology consciousness among the youth. It also aims to identify the most creative and the best science student researchers who will represent the country in the Intel International Science and Engineering Fair and other various international/regional science fairs.

The competitions will be conducted among high school students only. Students from **all** Special Science classes are **expected** to join the said competition.

First place winners in the different fair categories and fair divisions at the regional level shall represent the region to the national level science fair to be conducted on **October 26-29, 2011**.

The competition will start at the school level advancing to the division, regional, national then to the international levels. The clustering of science research projects, of the **different division fairs and fair categories shall;**

Cluster 1 - this is composed of students from ***regular high schools*** of both public and private and laboratory high schools of state colleges and universities.

Division Fair - Biological Science
Categories - Individual
Team

Division Fair - Physical Science
Categories - Individual
Team

Cluster 2 - this is composed of students from ***science high schools*** of both public and private and laboratory high schools of state colleges and universities.

Division Fair - Biological Science
Categories - Individual
Team

Division Fair - Physical Science
Categories - Individual
Team

Science research projects should conform with international rules published by the *Intel International Rules for Pre College Science Research: Guidelines for Science and Engineering Fairs* and each project is expected to have a Research Adviser and an Institutional Review Board or a Scientific Review Committee.

The research project should cover a maximum of ten (10) continuous months from January 2011 October 2011.

School/Division level:

The conduct of the school/division level shall be done on a weekend to conform with DepEd Order No 26, s. 2010.

School and Division levels Science Fair may be conducted simultaneously where the identified Board of Judges shall go around the schools to determine the winners to represent the school/division

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

Students of both regular and science high schools, private and public, shall participate in the division level science fair.

Regional level

The first place division level winners of both fair divisions in all fair categories are qualified to compete in the Regional Level Science Fairs. These winners shall have been properly scrutinized by identified SRC.

These regional representatives shall be properly endorsed by the Regional Office.

National Level

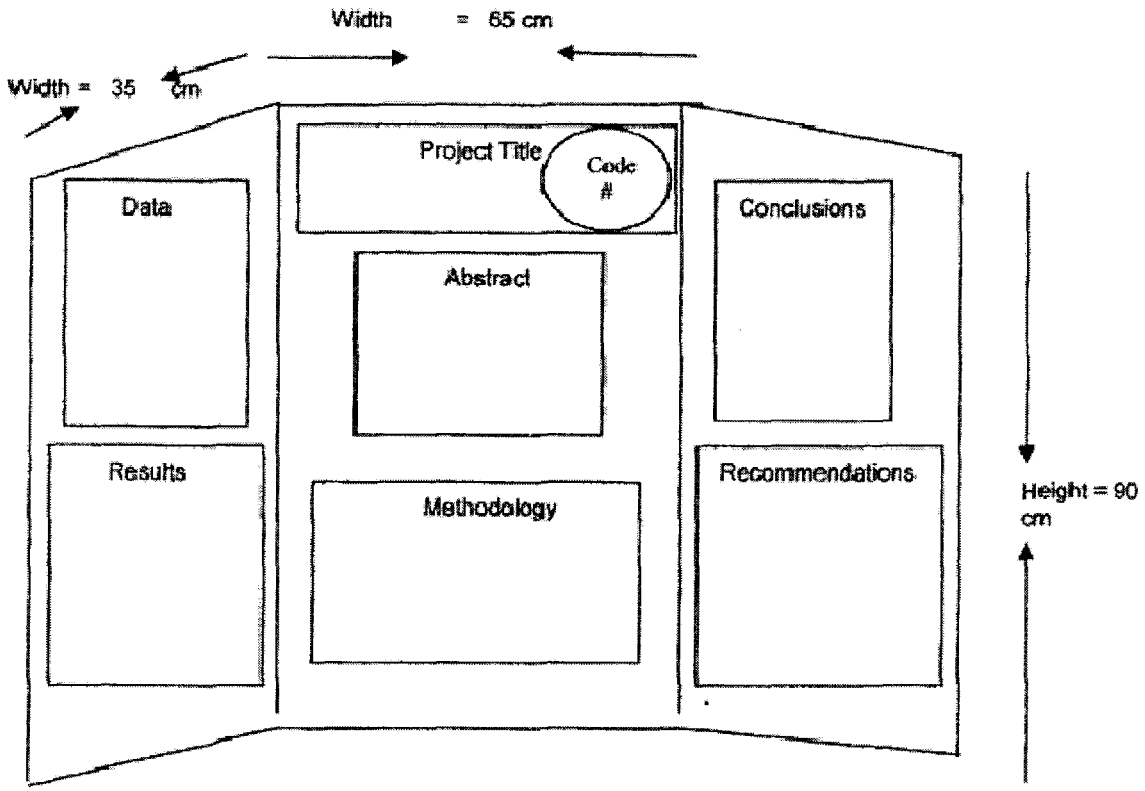
The First Place winners of both clusters and fair categories of the different fair divisions in the regional level science fair shall represent the region to the national level **science fair to be conducted on October 26-29,2011 at venue to be announced later.**

The Intel ISEF representatives shall be sponsored by Intel Technology Philippines, Inc.

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

The Exhibit

Size of Project



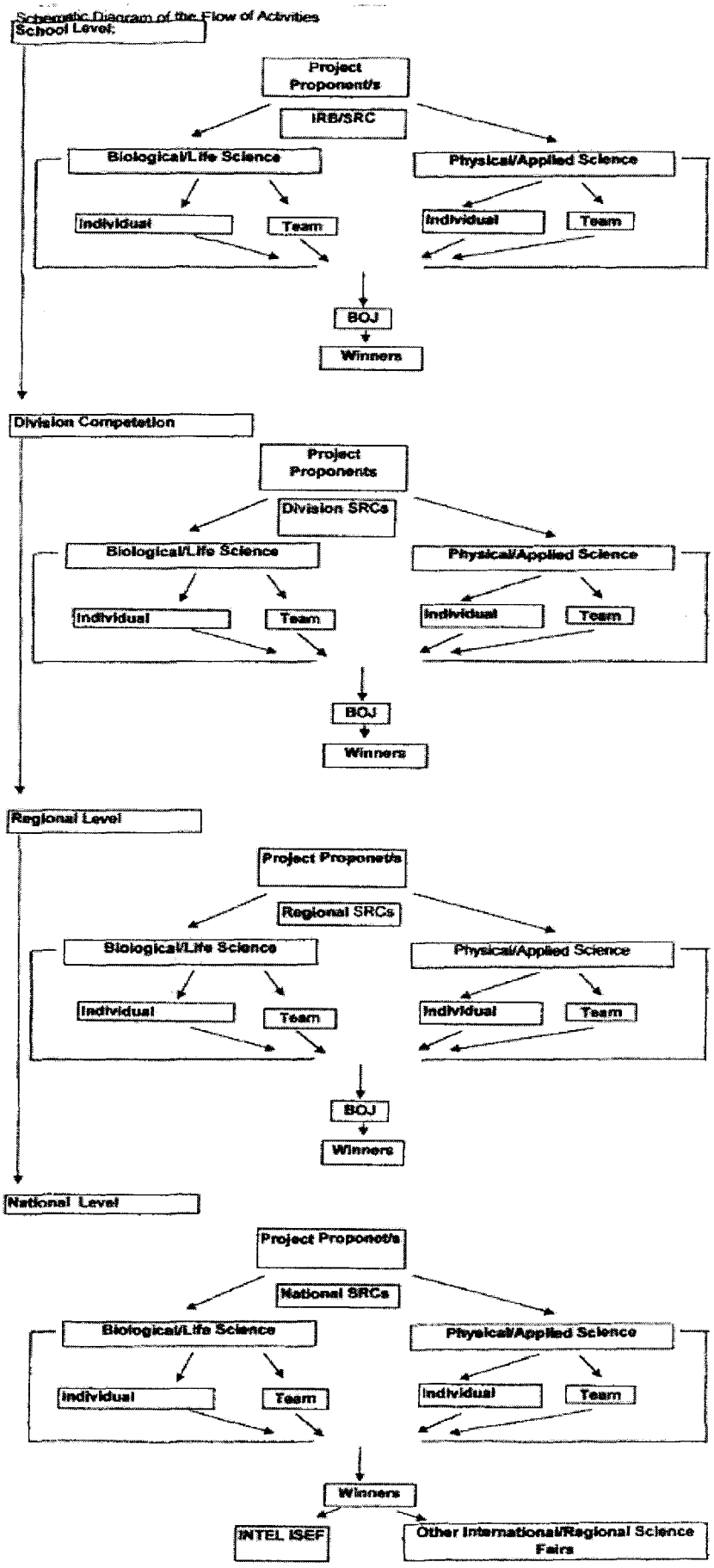
Required to be displayed

- Official Abstract
- Schematic diagram of the research methodology
- Data
- Results
- Conclusions
- Recommendations

Required to be presented by the Project Proponent to the BOJs during the exhibit

- Copy of the required forms
- Copy of the research write-up
- Logbook

(Enclosure No. 2 to DepEd Memorandum No. 190, s. 2011)



(Enclosure No. 3 to DepEd Memorandum No. 190, s. 2011)

2011 Calendar of Important Science Fair Activities and Requirements

Activity	Date	Required Tools	Persons Involved	Venue
Conduct of School Science Fair **Conduct of Division Science Fair**	**August 27-28, 2011** **September 3-4, 2011**	4 copies of write-ups	Project proponent Project adviser Department Heads/Division Science and Mathematics Supervisors	Designated Schools
Conduct of Regional Level Science Fair	**September 10-11, 2011**	4 copies of write-ups	Project proponent Project adviser Department Heads/Division and Regional Science and Mathematics Supervisors	Designated Schools
Submission to BSE of the Regional entries properly endorsed by the RO	**September 22, 2011**	4 copies of write-ups which are properly endorsed by the RO	BSE staff/Secretariat Project proponent Project adviser Department Heads/Division and Regional Science and Mathematics Supervisors	RO to CDD-BSE
2. Submission of entries to SRC	**September 22-26, 2011**	4 copies of write-ups which are properly endorsed by the RO	BSE staff/Secretariat	Identified addresses
3. Meeting of SRC members for deliberation and submission of consolidated SRC forms	**October 6-7, 2011**	Master list of participants Master list of SRCs Write-ups	Identified SRCs BSE staff/Secretariat	BSE Conference Room
7. Return of manuscripts/write-ups to RCs	**October 10, 2011**	One copy of write-up and SRC comments	RCs Project Proponent/s	Designated Regions
8. Submission of Write-ups to BSE	**October 19, 2011**	4 copies of write-ups	BSE secretariat	CDD-BSE
9. Submission of write-ups to identified BOJs	**October 21-22, 2011**	One copy each of the identified BOJ	BSE Secretariat	Identified addresses
11. Actual conduct of the National Level DepEd-ISF	**October 26-29, 2011**	Display tarpaulins	Regional delegates Project advisers RCs	To be announced

(Enclosure No. 4 to DepEd Memorandum No. 190, s. 2011)

Format of Research Paper

The Science Research project write-up must be typewritten and double-spaced on a bond paper using the following format:

I Title Page – title of the research project must be brief, simple and catchy. This shall make the reader follow the organization of the paper.

II Table of Contents – lists the different titles of each chapter of the report including the title of each important subdivision with the corresponding page number.

III Abstract - this should consist of a short, concise description or summary of the entire work with a maximum of 250 words. It is suggested to include the purpose of the study, brief description of the work, results and important conclusions of the scientific research.

IV Research Plan - this should include:

a) Materials and methods

This describes the materials/equipment, methods and procedures used to attain the final objective of the research paper.

b) Treatment/General Procedure

The part describes the manner and sequence by which each experiment or set of observations were done & how measurements were obtained.

The Research Plan gives information about the research to be made.

V Introduction – informs the reader of the problem under study. It sets the scene for the report.

a) Background of the Study- states the rationale of the study. It explains briefly why the investigator chose this study to work on.

b) Statement of Problem/Objectives – the nature & scope of the problem should be presented with clarity. Two types of objectives may be stated:

1. General Objective – this is related to the problem as given in the early part of the section.
2. Specific Objective – this states the purpose of each experiment conducted.

c) Significance of the Study- states the importance and relevance of the study specifically to education.

d) Scope and Limitations – states the coverage & extent of the study.

e) Review of Related Literature – this gives a sufficient background information that should be presented for readers to understand & evaluate the results of the study.

Only the most important studies and theories written on the topic should be included.

VI. Results and Discussion

Results – These are the pages with raw collected data, and data analysis. Included are the statistics and graphs. The data may be presented in full and discussed descriptively in the text or these may be summarized in tables, pictures and graphs. The discussion is the essence of your paper. Here, the results are compared with theoretical values, published data, commonly beliefs, and/or expected results.

VII Conclusion

This part states a generalization on what is implied or illustrated by the results of the experimentation.

VIII Recommendations

This portion stipulates the suggestions on future actions such as a new direction of research or further experiments to be performed, practices that might be adapted or discarded in order to attain certain goals or objectives.

IX References/Bibliography

In any study, the bibliography is essential, to prevent any accusations of plagiarism or violation of the Intellectual Property Rights Law, and to give fair credit to the work of authors in the field.

Reminders:

a) It is important to stick to one style and avoid confusing the reader.

b) All entries in the bibliography should be in alphabetical order, and they should use a hanging indent.

c) If more than one source from the same author are used, they should be sequenced by date and then by the first letter of the title, if the year of publication is the same.

Use the common reference style which is the APA (American Psychological Association) Style. Examples:

With one author only:

Sagan, C. (1980). *Cosmos*. New York: Random House

With 2 authors:

Calfee, R. C., & Valencia, R. R. (1991). *APA guide to preparing manuscripts for journal publication.* Washington, DC: American Psychological Association.

Edited Book:

O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), *Gender issues across the life cycle* (pp. 107-123). New York: Springer.

Journal Article:

If there are more than six authors, list the first six and then use: et al.

Hlastala, S. A. Frank, E. Kowalski, J. Sherrill, J. T. Tu, X. M. Anderson, B. Kupfer, D. J. (2000). Stressful life events, bipolar disorder, and the "kindling model. *Journal of abnormal psychology*, 109(4):777 - 86.

Article from an Online Journal:

Monroe, S. Harkness, K. (2005). Life Stress, the "Kindling" Hypothesis, and the Recurrence of Depression: Considerations From a Life Stress Perspective. *Psychological Review*, 112 (2). 417 – 445. Retrieved from:

http://psyc.queensu.ca/~harkness/documents/PR_Kindling_Paper.pdf

X Acknowledgements

Credit must be given to those who have assisted in the research including individuals, businesses and educational or research institutions. There should be no acknowledgements listed on a project display board.

(Enclosure No. 5 to DepEd Memorandum No. 190, s. 2011)

List of Science Fair Regional Coordinators

Region	Name of Regional Science Fair Coordinator
I	Cecilia P. Rosido
II	Leoncio P. Lumaban
III	Amelia R. Robles
IV-CALABARZON	Marissa SJ. Gatapia
IV-MIMAROPA	Jeannette V. Martinez
V	Leticia B. Bustamante
VI	Toribio M. Berano
VII	Jocelyn M. Conta
VIII	Rhodora V. Sison
IX	Basher O. Jamahali
X	Jose A. Alonsabe
XI	**Marilyn B. Madrazo**
XII	Ruth L. Estacio
XIII	Erlinda A. Atienza
CAR	Lilia B. Goc-oban
NCR	Juanita A. Ferido

(Enclosure No. 6 to DepEd Memorandum No. 190, s. 2011)

Data for Submission to BSE

Form 1a - School Level - Biological Science

CLUSTER 1							
Region	Number of Schools	# of Projects			# of Students		
		Indiv	Team	Total	Indiv	Team	Total

Form 1b - School Level - Applied/Physical Science

CLUSTER 1							
Region	Number of Schools	# of Projects			# of Students		
		Indiv	Team	Total	Indiv	Team	Total

Form 2a - Division Level - Biological Science

CLUSTER 1							
Region	Number of Schools	# of Projects			# of Students		
		Indiv	Team	Total	Indiv	Team	Total

Form 2b - Division Level - Applied/Physical Science

CLUSTER 1							
Region	Number of Schools	# of Projects			# of Students		
		Indiv	Team	Total	Indiv	Team	Total

Form 3a - Regional Level - Biological Science

CLUSTER 1							
Region	Number of Schools	# of Projects			# of Students		
		Indiv	Team	Total	Indiv	Team	Total

Form 3b - Regional Level - Applied/Physical Science

CLUSTER 1							
Region	Number of Schools	# of Projects			# of Students		
		Indiv	Team	Total	Indiv	Team	Total

Form 4a - School Level - Biological Science

CLUSTER 2							
		# of Projects			# of Students		
Region	Name of School	Indiv	Team	Total	Indiv	Team	Total

Form 4b - School Level - Applied/Physical Science

CLUSTER 2							
		# of Projects			# of Students		
Region	Name of School	Indiv	Team	Total	Indiv	Team	Total

Form 5a - Division Level - Biological Science

CLUSTER 2							
		# of Projects			# of Students		
Region	Name of School	Indiv	Team	Total	Indiv	Team	Total

Form 5b - Regional Level - Biological Science

CLUSTER 2							
		# of Projects			# of Students		
Region	Name of School	Indiv	Team	Total	Indiv	Team	Total

Form 6a - Regional Level - Applied/Physical Science

CLUSTER 2							
		# of Projects			# of Students		
Region	Name of School	Indiv	Team	Total	Indiv	Team	Total

Form 6b - Regional Level - Applied/Physical Science

CLUSTER 2							
		# of Projects			# of Students		
Region	Name of School	Indiv	Team	Total	Indiv	Team	Total

(Enclosure No. 7 to DepEd Memorandum No. 190, s. 2011)

Excerpts from the Intel ISEF 2010 International Rules and Guidelines. For details of said rules and regulations, please download
http://www.societyforscience.org/isef/dosument/index.asp

Duties and Responsibilities

1) The Student Researcher(s)

This refers to the project proponents. A research project is represented by an individual or a team which is composed of a maximum of three members.

The student researcher is responsible for all aspects of the research project including the enlisting of the aid of any needed supervisory adults and obtaining the necessary approvals and doing the experimentation, data analysis, etc. involved in the research project.

2) The Adult Sponsor or the Project Adviser

This refers to the science teacher the student is working with. He/she should have a thorough background in science. This person is responsible for ensuring the safety and eligibility of the research project. The Adult Sponsor should be familiar with the rules and regulations that govern potentially dangerous research as they apply to a specific student project. This may apply chemical and equipment usage, experimental techniques, research involving human and vertebrate animals, and cell cultures, microorganisms, or animal tissues.

3) The Qualified Scientist

Qualified Scientist should have a doctoral/professional degree in the biological or medical sciences as it relates to the student's area of research. In consideration, a master's degree with equivalent experience and/or expertise in the student's area of research is acceptable when approved by a Scientific Review Committee (SRC).

The Qualified Scientist must be thoroughly familiar with the country's laws related to the project.

4) The Designated Supervisor

The Designated Supervisor is an adult who is directly responsible for overseeing student experimentation. The Designated Supervisor need not have an advanced degree, but should be thoroughly familiar with the student's project, and must be trained in the student's area of research. The Adult Sponsor may act as the Designated Supervisor. If a student is experimenting with live vertebrates and the animals are in a situation where their behavior or habitat is influenced by humans, the Designated Supervisor must be knowledgeable about the humane care and handling of the animals.

5) The Scientific Review Committee (SRC)

The SRC is a group of qualified individuals who are responsible for evaluation of student research, certifications, research plans and exhibits in compliance with the Rules and pertinent laws and regulations.

A Scientific Review Committee (SRC) examines projects for the following:

a) Evidence of literature search
b) Evidence of proper supervision
c) Use of accepted and appropriate research techniques
d) Completed forms, signatures and dates showing maximum of one year duration of research and appropriate pre-approval dates (when needed)
e) Evidence of search for alternatives to animal use
f) Humane treatment of animals
g) Compliance with rules and laws governing human, animal research and those involving potentially hazardous biological agents
h) Documentation of substantial expansion for continuation projects
i) Compliance to ISEF ethics statement

The SRC must include:

a) a biomedical scientist (Ph.D., M.D., D.V.M., D.D.S., or D.O.)
b) an educator
c) at least one other member

Rules for ALL Studies Involving Vertebrate Animals

1) The use of vertebrate animals in science projects is allowable under the conditions and rules in the following sections. Vertebrate animals, as covered by these rules, are defined as live, nonhuman vertebrate mammalian embryos or fetuses, tadpoles, bird and reptile eggs within three days (72 hours) of hatching, and all other nonhuman vertebrates (including fish) at hatching or birth.

2) Alternatives to the use of vertebrate animals for research must be explored and discussed in the research plan.

Alternatives include the following "3 R's":

- ☐ **Replace** vertebrate animals with invertebrates, lower life forms, tissue/cell cultures or computer simulations
- ☐ **Reduce** the number of animals without compromising statistical validity
- ☐ **Refine** the experimental protocol to lessen pain or distress to the animals.

3) Research projects which cause more than momentary pain or suffering to vertebrate animals or which are designed to kill vertebrate animals are prohibited.

(Note: Humane euthanasia is permitted under certain conditions when the research is conducted at a regulated research institution.)

4) The following types of studies on vertebrate animals are **prohibited**:
   a. All induced toxicity studies involving a poison or toxin that could impair health or destroy life, including alcohol, acid rain, insecticide, herbicide, or heavy metals.
   b. Behavioral experiments involving operant conditioning with aversive stimuli, mother/infant separation or induced helplessness
   c. Studies of pain
   d. Predator/vertebrate prey experiments

5) Because weight loss is one significant sign of stress, the maximum permissible weight loss or growth retardation (compared to controls) of any experimental or control animal is 15%.

6) If an experimental design requires food or water restriction, it must be appropriate to the species, but may not exceed 18 hours.

7) If there are unexpected deaths in either the experimental or control groups, the cause of the death must be investigated. If the experimental procedure is responsible for the deaths, the experiment must be immediately terminated. A death rate of 30% or greater in any group or subgroup is not permitted and the project will fail to qualify for competition.

8) Students performing vertebrate animal research must follow local, state, country and U.S. federal regulations.

9) Except for observational studies, a Qualified Scientist or Designated Supervisor must directly supervise all research involving vertebrate animals.

10) A Scientific Review Committee (SRC) and/or an Institutional Animal Care and Use Committee (IACUC) must approve all research before experimentation begins. (An IACUC is the review and approval body at a regulated research institution for all animal studies.) The research plan for vertebrate animal studies must include:

a) Justify why animals must be used, including the reasons for the choice of species and the number of animals to be used. Describe any alternatives to animal use that were considered, and the reasons these alternatives were unacceptable. Explain the potential impact or contribution this research may have on the broad fields of biology or medicine.

b) Describe in detail, how the animals will be used. Include methods and procedures, such as experimental design and data analysis. Describe the procedures that will minimize the potential for discomfort, distress, pain and injury to the animals during the course of experimentation. Identify the species, strain, sex, age, weight, source and number of animals proposed for use.

11) After initial SRC approval, a student with any proposed changes in the Research Plan must repeat the approval process before laboratory experimentation/data collection resumes.

12) Studies involving behavioral observations of animals are exempt from prior SRC review if **ALL** of the following apply:

- ☐ There is no interaction with the animals being observed,
- ☐ There is no manipulation of the environment in any way and
- ☐ All federal or state fish, game and wildlife laws and regulations are followed.

13) Certain types of vertebrate animal studies may be conducted at home, school or other non-regulated research sites, whereas other studies must be conducted at a regulated research institution. See A. Non-regulated Research Site and B. Regulated Research Site below for rules and site descriptions

Additional Rules for Projects Conducted in a Non-regulated Site
Vertebrate animal studies may be conducted at a **non-regulated** research site (home, school, farm, ranch, in the field, etc.). This includes:

- ☐ Studies involving animals in their natural environment
- ☐ Studies involving animals in zoological parks
- ☐ Studies involving livestock that use standard agricultural practices

1) These projects must adhere to BOTH of the following guidelines:

a. The research involves agricultural, behavioral, observational or supplemental nutritional studies on animals.

b. The research involves only non-invasive and non-intrusive methods that do not negatively affect an animal's health or well-being.

(Note: All studies not meeting the above criteria must be conducted at a Regulated Research Institution.)

Rules for Projects Conducted in a Regulated Research Institution

All studies not meeting the criteria in Section A. must be conducted in a regulated research institution. A regulated research institution is defined as a professional research/teaching institution that is regularly inspected by the USDA and is licensed to use animals covered by the Animal Welfare Act. Also included are all federal laboratories such as National Institutes of Health, Veteran's Affairs Medical Centers and the Centers For Disease Control. In addition, pharmaceutical and biotechnology companies that utilize research animals that are not covered by the Animal Welfare Act but have an operational Institutional Animal Care and Use Committee and program structured in compliance with U.S. federal laws are included in this definition.

(NOTE: Some research that is permissible for professionals in research institutions is not appropriate for pre-college students.)

1) The Institutional Animal Care and Use Committee (IACUC) must approve all student research projects before experimentation begins. Such research projects must be conducted under the responsibility of a principal investigator. The local SRC must also review the project to certify that the research project complies with ISEF Rules. This SRC review should occur before experimentation begins.

2) Proper euthanasia at the end of experimentation for tissue removal and/or pathological analysis is permitted. Only the qualified scientist or an institutional representative may perform the euthanasia..

3) Research projects that cause more than momentary pain or suffering to vertebrate animals are prohibited.

Rules for ALL Studies Involving Potentially Hazardous Biological Agents

1) The use of potentially hazardous microorganisms (including bacteria, viruses, viroids, prions, rickettsia, fungi, and parasites), recombinant DNA (rDNA) technologies or human or animal fresh/frozen tissues, blood, or body fluids is allowable under the conditions and rules that follow. All of these areas of research may involve potentially hazardous biological agents and require special precautions.

2) An appropriate review and approval committee (SRC, IBC, IACUC) must approve all research before experimentation begins. The initial risk assessment determined by the student researcher and adults supervising the project must be confirmed by the SRC.

3) Experimentation involving culturing of potentially hazardous biological agents, even BSL-1 organisms, **is prohibited in a home environment**. However, specimens are allowed to be collected at home as long as they are immediately transported to a laboratory with the appropriate level of biosafety containment.

4) Research determined to be biosafety levels 3 & 4 is prohited.

5) Laboratory studies utilizing MRSA (methicilin resistant Staphyloccocus aureus) and VRE (Vancomycin-resistant enterococci) are prohibited.

6) Studies intended to produce or genetically engineer bacteria with multiple antibiotic resistance are prohibited.

7) Naturally-occuring plant pathogens may be studied (not cultured) at home, but may not be introduced into a home/garden environment.

8) A risk assessment must be conducted by the student and adult supervisors prior to experimentation and a final biosafety level must be determined or confirmed by the SRC.

9) Research determined to be at Biosafety Level 1(BSL-1) may be conducted in a BSL-1 or higher laboratory. The research must be supervised by a trained Designated Supervisor or a Qualified Scientist. The student must be properly trained in standard microbiological practices.

10) Research determined to be a Biosafety Level 2 (BSL-2) MUST be conducted in a laboratory rated BSL-2 (commonly found in a regulated research institution). The research must be reviewed and approved by the Institutional Biosafety Committee (IBC) or a letter must be obtained from an institutional representative that the Research does not require review. The research must be supervised by a Qualified Scientist. The student researcher must receive extensive training, demonstrate competency and be directly supervised while conducting microbiological procedures.

11) All potentially hazardous biological agents must be properly disposed of at the end of experimentation in accordance with their biosafety level. Following are acceptable procedures for disposal of cultured materials: Autoclaving at 121 degrees Celsius for 20 minutes, use of 10% sodium hypochlorite, incineration, alkaline hydrolysis, and biosafety pick-up.

12) Studies involving the culturing of human or animal waste, including sewage sludge, must be treated as a BSL-2 study.

13) The following types of studies are exempt from prior SRC review:

a. No additional forms required:
   i. studies involving baker's and brewer's yeast except when involved with rDNA studies
   ii. commercially available coliform water test kits
   iii. studies involving Lactobacillus, Bacillus thurgensis, nitrogen-fixing, oil-eating bacteria and algae-eating bacteria introduced in their natural environment (not exempt if cultured in a Petri dish environment that could be potentially contaminated)

b. Require Risk Assessment Form 3
   i. studies involving protests, archae and similar organisms
   ii. research using manure for composting or other non-culturing experiments and fuel production

14) Any research changes in the Student Checklist (!A) and Research Plan by the student after the initial SRC approval must have subsequent SRC or IBC review and approval before such changes are made and before experimentation resumes.

Rules for ALL Projects Involving Hazardous Chemicals, Activities and Devices

1) The use of hazardous chemicals and devices and involvement in hazardous activities require direct supervision by a Designated Supervisor, except those involving DEA-controlled substances which require supervision by a Qualified Scientist.

2) The student researcher must conduct a risk assessment in collaboration with a Designated Supervisor or Qualified Scientist prior to experimentation. This risk assessment is documented on the **Risk Assessment Form 3**

3) Student researchers must acquire and use regulated substances in accordance with all local, state, U.S. federal and country laws. For further information or classification for these laws and regulations, contact the appropriate regulatory agencies.

4) For all chemicals, devices or activities requiring a Federal and/or State Permit, the student/supervisor will be expected to have the permit prior to the onset of experimentation. A copy of the permit should be available for review by adults supervising the project and/or the Scientific Review Committee in their review prior to competition.

5) **The student researcher must design experiments to minimize the impact that an experiment has on the environment. For instance, using minimal quantities of chemicals must subsequently be disposed of in an environmentally safe manner in accordance with correct laboratory practices.**