Palm Bay Academy (PBA)

Experimenting Into The Future

Kennedy Space Center Visitor Complex(KSCVC)

SCIENCE FAIR PHILOSOPHY

We have an infinite amount to learn
both from nature and from each other"

John Glenn

"Experimenting Into The Future" Science Fair believes great potential lies with our children. Their innovative discoveries and cutting edge research will drive our world to a new and bright future. We plan to make use of this ingenuity and fast track it into reality. Children of all ages will work on individualized research projects, either as part of their core curriculum or through independent study as in the case of home educated children. These projects will be centered on a designated theme chosen by our science fair committee. Students will broaden scientific awareness and explore their own special interests while learning to think critically, arrive at conclusions and present their ideas in a professional environment. It is our vision that through Involvement in our science fair students will develop their higher level thinking and problem solving skills as well as a respect for objective scientific analysis. Students, through the guidance of parents, teachers, mentors, and Qualified Scientists, will be directed toward more advanced study, helping to maintain and fuel our scientific community now and into the future. Ultimately we envision that our students will be infused with the joy of exploring the unknown and the pride that comes with accomplishing the impossible against all odds. Leaving behind the limitations of uninformed opinion and intolerance, they will embrace challenge as opportunity and obstacles as new possibilities.

There are people who make things happen,
there are people who watch things happen,
and there are people who wonder what happened.
To be successful, you need to be a person who makes things happen."

James A. Lovell

[redacted]

Palm Bay Academy Representatives

Madhu Longani
Marilyn Kinsel
Donna Moore

KSCVC Host Representatives

Darlene Koenig
Marketing Rep - TBD
Bill Zunteg

Science Fair Committee Members

Madhu Longani
Marilyn Kinsel
Don Bogard
Donna Moore
Darlene Koenig

SCHOLARSHIPS -
http://www.scholarships4students.com/science_service_intel_international_science_%26_engineering_fair_(isef).htm and
FORMS and POLICIES -
http://www.sciserv.org/isef/

SCIENCE FAIR SPONSORS

We wish to thank our sponsors and business partners for their efforts and support in bringing this science fair to life. We are fortunate to have such support and wish to acknowledge this. Our sponsors and business partners are listed below and you will see them at the science fair. Please support them.

Palm Bay Academy is dedicated to serving the needs of its students by providing an opportunity for an enriched academic environment and acting as an extension of the Brevard County public school system to serve each student with excellence as the standard. Palm Bay Academy was established to increase student achievement and organizational innovation in a learning environment offering an excelled and enriched curriculum for K-8. The Montessori philosophy forms the fundamental conceptual basis of the elementary school curriculum keeping in mind that a child's development is nurtured in an environment of freedom. Our belief in education is summed up by Dr. Montessori when she stated, "Never let children risk failure until they have a reasonable chance of success." We emphasize discipline, skills, challenging standards, creativity, and flexibility to develop a student's personal value system by which to guide their lives as members of their community and in the future for today's global society.

Crescent is proud to be Palm Bay Academy's sister school. The educational mission of Crescent Public Schools is to educate students and enhance positive character within a safe, nurturing environment while encouraging life-long learning, productivity, responsibility, success and citizenship. The Crescent School District is recognized for its progressive application of today's technology for instruction in the regular public school classroom. Classes consist of both face-to-face and online student-teacher interactions. Curriculum delivery and assignment scheduling for our "blended" high school and middle school classes are done with Moodle ™, a password-protected Class Management System (CMS). We strongly believe that technology makes teachers more important than ever! Good teaching practices are still good teaching practices, even in a "digital" learning environment! Computers don't teach students − teachers teach students!

This 4700 acre eco-ranch and wildlife conservation area encompasses nine distinct ecosystems, beautifully preserved just as nature intended. You'll experience natural streams, forests, pastures, wetlands and learn about the wide array of Forever Florida's wildlife including alligators, black bears, white-tail deer and the endangered Florida panther. Saving Florida's wilderness was Allen Broussard's dream. He loved roaming the area next to the family's Crescent J Ranch as a boy. When he became a Wildlife Ecologist, he came to understand its ecological value. Dr. Broussard, a 10th- generation rancher from Louisiana, and his wife, Margaret, made Allen's dream come true after his all-too-early passing. They founded the Allen Broussard Conservancy for the purpose of purchasing the land, known as Forever Florida, and keeping it as a wildlife preserve. Visitors to Forever Florida make a positive impact on the environment as a substantial portion of proceeds go toward the purchase of additional lands to be conserved.

SCIENCE FAIR SPONSORS

Delaware North and **Kennedy Space Center Visitor Complex:**
Delaware North was re-awarded the Kennedy Space Center Visitor Complex concessions contract in partnership with NASA. The recent contract, issued in 2012, spas for ten years and includes the operation of retail, food, beverage, education, events, tours, and transportation. Located on a Merritt Wildlife Refuge this unique setting provides an experience out of this world. We are honored to provide services that enhance the guest experience while learning about their history and future of space exploration. Community involvement through projects and events foster exceptional stewardship. Annually we participate in the St. John's River, the Cocoa Beach and NASA's KSC shore line clean up.

Maverick Medical Marketing – "M3" – is a full service marketing company dedicated exclusively to serving the health and medical industry. M3 utilizes a proven strategic process to develop and implement customized marketing and publication initiatives; provide compelling public relations; and devise advertising programs that deliver tangible results for their health and medical clients. From thoughtful and effective public relations campaigns, to designing websites, brochures or multimedia advertisements – health and medical providers turn to M3 for cost effective solutions that produce measurable results. M3′s team is comprised of some of the best and brightest in the business – experienced in publishing, marketing, public relations, event promotion and advertising. They are specialists that provide ongoing strategic counsel as well as hands-on support to help their clients generate awareness, build credibility, create demand and meet revenue objectives.

Visual Learning Systems is an educational science publisher whose mission is to reignite a passion for teaching and learning science. VLS' animators, designers, videographers, and producers led by Brian A. Jerome, Ph.D, masterfully use their experience in education to create powerful learning tools. Products include: eTextbooks, videos, images, animations and teacher's guides to support the K-14 science curriculum. eTextbooks features interactive 3-D

animations, narrated videos, glossary, note cards, vocabulary flash cards, and assessment quizzes aligned with the Next Generation Science Standards. Video programs feature original live-action footage and animations, closed-captioning, frequent on-screen questions, repetition of vocabulary, clear visual cues for understanding, and video assessments. Teacher's guides include preliminary and post-tests, laboratory investigations, vocabulary exercises, and hands-on activities. Visual Learning Systems' science videos are purchased by educational organizations throughout the United States and internationally, including K-12 Schools, Community Colleges, Dual Language and ESL Programs, Special Educators, Schools for the Deaf, District Media Centers, State Departments of Education, and Instructional Television Stations. Visual Learning Systems' products are adaptable to all learning styles and abilities.

In order to prevent loss to the student concerning his/her exhibit, the following rules should be followed.

1. **The Committee will make every effort to safeguard all projects, but the responsibility for the security of the entry rests with the individual contestant.**

2. **On Judging Day only Science Fair Officials, judges and student participants will be permitted in the judging area. Special accommodations will be made for special needs students and others through the Chairman or Co-Chair of the Science Fair.**

3. **Open House – is** November 23, 2013 **from** 3:00 – 6:30**. Refer to item # 1 for clarification.**

SPECIAL ACKNOWLEDGEMENT

We would like to give special acknowledgement to the following for use of forms, category definitions, Quick Reference List of Vocabulary Words, Science Project Time Line, and other items used in this handbook.

http://www.massscifair.com/
See www.scifair.com for MSSEF forms

http://ncsciencefair.org/

Parkway School District Science Fair Manual
http://www.pkwy.k12.mo.us/CandD/CurriculumAreas/Science/documents/ScienceFairManual.pdf

http://www.societyforscience.org/isef/rulesandguidelines

June 4, 2013	**Registration packets distributed to area schools and home education organizations**
July 19, 2013	**Deadline to receive completed school registration and fees from area schools and home education centers**
August 27, 2013	**Distribution of Science Fair Packets to school contacts (schools begin work on their science fair projects)**
August 31, 2013	**Information meeting with school contacts (Q & A session)**
September 4, 2013	**Information distributed from school contacts to their schools**
October 19, 2013	**Deadline for receiving Home Education Electronic student listing for PBA Home Education Science Fair, send to Donna Moore – KSCVC/PBA Science Fair Coordinator. Also deadline for registered schools to request extension for their fair dates.**
November 2, 2013	**Home education science fair projects reviewed and judged at the local school level. Also deadline for all other registered schools to hold their fairs.**
November 12, 2013	**Deadline for receiving Student registration and fees as well as Electronic student listing for Experimenting Into The Future Science Fair, send to Donna Moore – KSCVC /PBA Science Fair Coordinator**
November 21, 2013	**School Science Fair Contact Meeting** **Meeting at 1:00 p.m.** **Turn in application cards at this meeting** Location to be determined, cards will be labeled with a receipt number per order of receipt
November 21, 22 & 23, 2013	**Science Fair Activities** **Kennedy Space Center** **GPS coordinates, 28°31'34.10"N and 80°40'45.12"W**
November 21, 2013	**Set up day at KSCVC for Science Projects** **9:00 AM – 3:00 PM**
November 22, 2013	**Projects judged with students** **Start of winner notification by Committee (phone/e-mail)**
November 22, 2013	**Schools notify student winners**
November 23, 2013	**Open House – 3:00 PM – 6:30 PM** **Science Awards Ceremony – 7:00 PM** **Science Projects to be picked up by school Representative/s at the close of the fair**

SCHOOL FAIR CONTACTS

Information will be sent via e-mail regarding all aspects of the "Experimenting Into The Future" Science Fair. *Please contact if you have any questions during the year.*

BIOLOGICAL:
Grades 3-8

Projects that deal with the vital processes of living organisms, plants, microorganisms, and animals (including humans), and how these processes are affected as a result of controlling a variable. Processes may include but not be limited to such functions as growth, maintenance, breathing rate, pulse, learning, memory, vision, etc: **Animals/insects must be treated humanely.**

PHYSICAL:
Grades 3-8

Projects related to the natural sciences such as physics, chemistry, as well as earth and space sciences that deal primarily with non-living materials. Topics may include but not be limited to: properties of matter, physical and chemical changes, various forms of energy, forces, motion, processes that shape the earth, weather, etc.

ENVIRONMENTAL:
Grades 3-8

Projects that deal with human relationships with their natural surroundings. Projects may include the relationships of energy, population, pollution, resource allocation and depletion, conservation, transportation, and technology to the total human environment. Topics may include but not be limited to: ways that humans protect or improve the quality of life by wisely using, reusing, recycling, or reducing use of our natural resources; ways that technology impacts our resources; ways that humans negatively impact the quality of life by pollution, etc.

BEHAVIORALU /SOCIAL SCIENCE:
Grades 9-12

Any study such as is done by sociologist, anthropologists, psychologists, linguists, etc. that examines animal activities to discover recurrent patterns. For example: trigger of fear, learned behavior, actuality of prejudice, effect of color on choice, pecking order, group size. Because of protocol restrictions it is better to do observational studies in natural settings.

ENGINEERING:
Grades 9-12

Projects that deal with putting scientific knowledge to work. Includes civil, chemical, electrical, or mechanical engineering. For example: building robots, new electrical switches, faster pine wood derby cars, etc. All five types of studies are possible. Models and inventions are frequently used.

MATHAMATICS:
Grades 9-12

Math projects deals with numbers; types, relationships, and manipulation. Includes algebra, geometry, calculus. For example: abacus design, pattern of repeating decimals, families of numbers. Collection, models, and inventions are used frequently.

COMPUTER:
Grades 9-12

Studies which modify or use the hardware or software in a new way. For example: using an application in a new way. collections, models, and inventions are used.

EARTH/SPACE:
Grades 9-12

Projects that deal with the soil, water and air of our planet and objects in space. Includes geology, meteorology, astronomy. For example: identify rocks or stars, forecast weather. All five types of studies are possible.

PHYSICS & ENERGY:
Grades 9-12

Deals with the physics and energy of matter interactions. Includes solid-state theory, motion, biophysics, thermodynamics, mechanics, quantum mechanics, electricity, magnetism, sound, light, optics , plasma, etc. For example: forces on a falling object, trajectory of an object, electrical circuits, etc. All five types of investigations are used.

- The school and student determine project categories.
- Projects that could fall in more than one category should be entered in the category of major emphasis.
- 9-12 grade level projects can be performed by 6-8 grade level students if appropriate guidance and supervision are involved. Contact Science Fair Committee Members for allowances and approval.

QUICK REFERENCE LIST OF SCIENCE FAIR PROJECT VOCABULARY WORDS

ACKNOWLEDGEMENTS - Statements which give recognition to anyone who helped with the project. General terms such as "teacher", "parent", specialist", "expert", should be used in place of individuals' names.

BACKGROUND INFORMATION - Report which contains information collected from research notes.

BIBLIOGRAPHY - Alphabetical list of the resources used when completing research notes that is written in a special way listing authors, titles, publisher, pages etc.

CONCLUSIONS - Statements that summarize the experiment and relate the results to the hypothesis and the background information.

CONSTANT VARIABLES - The many parts of the experiment that are kept the same during all tests.

CONTROL - The part of the experiment with no change to the independent variable.

DATA TABLE - Metric measurement of each of the trials recorded in columns, plus two additional lines at the bottom showing the total and average of each of the trials. The data table should have a title which is labeled with the dependent variable and the independent variable.

DEPENDENT VARIABLE - The condition in the experiment that is watched and measured. The results of the tests should be recorded in metric measurement, when applicable.

DISPLAY BOARD - Three-sided, free-standing board with attached base; it displays the parts of the project.

FUTURE STUDY - A statement which tells what you might do if you decide to perform this experiment again.

GRAPH - A bar or line graph of the averages shown on the data table. The horizontal or "X" axis is labeled with the independent variable. The vertical or "Y" axis label is labeled with the dependent variable. A title should be written at the top.

HYPOTHESIS - A prediction or educated guess about the expected results of the experiment. It is written with "If " as the first word in the statement, "then" in the middle of the statement.

INDEPENDENT VARIABLE - The part of the experiment that is changed and tested as the experiment is done three different ways. Example: three different brands of popcorn that are being tested - each of them with at least three trials.

LOG BOOK - Daily diary of every step of the experiment which is generally handwritten. It includes dates, notes, data, interviews, thoughts or reflection. Pages must be numbered.

PROBLEM - A question that asks what will be tested in the experiment.

PROCEDURE - A list of the materials used in the experiment and the exact steps done to complete the experiment. This part is to be written carefully so that if another person were to perform the test, he/she could follow the procedure easily.

RESEARCH NOTES - Collections of information about the experiment that come from encyclopedias, CD-ROM encyclopedia printouts, science books, library books, magazines, interviews, etc.

SCIENTIFIC WORTH - Statements that assess the quality of a study and describes any scientific advantage to knowing the results.

SUMMARY OF RESULTS - One or two statements which explain the graph.

TITLE - Cleverly written words used as an attention-getter on the display board.

TRIAL - One entire run of the experiment with a control and each alteration of the independent variable. A minimum of three trials is needed.

SCIENCE PROJECT TIME LINE

Here is a time line to help you complete the steps of your project. Be sure to read and follow the instructions in this guide and to check the Science Project Scoring Guide as you work through each step of your project.

Date Due	Completed	Steps
_____	_____	Begin a log book. Write down possible topics and ideas for your project.
_____	_____	Select a topic and choose your study design.
_____	_____	Gather background information about the history, significance, facts, and methods of study for your topic. Prepare a bibliography of your sources.
_____	_____	Decide on the problem and the hypothesis. Define your independent variable (IV), dependent variable (DV), and constant variables(CV's).
_____	_____	List the materials and write the procedure.
_____	_____	Collect the materials you will need (including display board) and do a trial run of your procedure to be sure that it is going to work as planned.
_____	_____	Prepare a data table for recording results.
_____	_____	Run at least THREE trials of your procedure and collect data using metric measurements. Take photographs or draw pictures being sure NOT to include peoples' faces.
_____	_____	Construct a graph that shows the averages of your results and write a summary of your findings..
_____	_____	Write the conclusion and discuss the scientific worth of your project. (secondary only).
_____	_____	Write the experimental report (secondary only).
_____	_____	Prepare the items for the display and arrange them attractively on the board.

Your completed science fair project is due on _____.

Experimenting Into The Future, Elementary (3-8) Science Fair

The following guidelines will be used in the process of screening and exhibiting projects for the *Experimenting Into The Future* Elementary Science Fair.

1. **Students' projects, research plans, and testing procedures must be reviewed and approved by their teacher.**
   A. Each school should have a Science Fair Committee in place that can support the classroom teacher with advice and guidance.
   B. Students designing their own experiments for science projects will need guidance to conduct safe and ethical science. A 3-8 Science Project Research Plan and Approval Form" template is provided to assist. (pages 29 & 30)
   C. Teachers, students and parents should work together to review and complete this form, so that everyone has an understanding of the intended project and is aware of any potentially dangerous or unethical situations before the student begins any testing.
   D. Students should always follow approved procedures and never perform unauthorized experiments.
   E. The Intel International Science and Engineering Fair (Intel ISEF) website provides additional resources and guidelines that can be a valuable resource for students, teachers and parents. www.societyforscience.org/isef/rulesandguidelines.

2. **Students must be enrolled in a public, charter or private school. In the future, home education students may be asked to submit their entries to the public school where the child would attend according to the district attendance zone guidelines. The home education entry should contact the public school about their fair, and then be judged along with all the other entries from the public school. If selected, the home education entry would attend the fair as part of the public school science team. For 2013 current instructions, See Home Education Entry and Eligibility (pg 13).**

3. **Each school may send one winner for each category (3-8, Biological, Physical or Environmental), (9-12, Behavioral/Social, Engineering, Mathematics, Computer, Earth/Space, Physics & Energy) and grade level for a maximum total of thirty two (32) students.**

4. **School Contact Coordinator will send an electronic student listing following the school fair or by November 12, 2013 to (TBD – KSCVC/PBA Science Fair Coordinator).**

5. **Projects must be individual. Group exhibits will not be admitted. Only exhibits prepared during the current school year may be entered.**

6. **Exhibits must be constructed and developed by the students. Help must be limited to advice only.**

7. **Exhibits must be confined to table space with limits of 4 feet in height, 2 feet in width, and 12 inches deep. No display items in front of exhibit. ONLY Research or Daily logs. Projects larger than size limitations will be disqualified at check-in area.**

8. **Each school will be responsible for setting up the displays. This should be done on Thursday, November 21, 2013 between 9:00 AM and 3:00 PM.**

9. **Committee reserves the right to:**
   A. refuse an exhibit that is considered unsafe
   B. disqualify an exhibit which may bring discredit to the Fair
   C. refuse a project that did not treat invertebrates or vertebrates humanely
   D. refuse a project with the mortality rate of 30% or greater in any vertebrate group or subgroup. A project with these results is not permitted to be entered into the fair, even if results are unintentional/accidental
   E. exclude projects not following proper procedures from the fair and may (or will) not be eligible for awards

10. **Students are not allowed to do projects that are clearly dangerous.**
    A. Testing involving firearms, knives or other items that could be considered, as weapons are not permitted.
    B. Testing involving fireworks or other explosives is not allowed.
    C. Any project involving controlled substances, prescription drugs, alcohol, and tobacco is not allowed.
    D. The use of any potentially hazardous chemicals, devices, and activities require direct supervision by a Designated Supervisor.

11. **Project displays are limited to:**
    A. Research and Daily Log – in front of project show board
    B. Research data and other items should be displayed through the use of: Charts, Drawings, Graphs and Photographs
    C. 3-D objects are ***not*** to be exhibited on the show board, except for foam letters

12. **Microbial experimentation (involving microscopic organisms such as bacteria, fungi, etc.) is potentially dangerous and should only be done with expert and careful supervision. Samples/organisms should NOT be collected, isolated and/or cultured from the environment as they are potentially pathogenic. This includes, but not limited to, projects involving blood, growing mold and culturing swabs from the environment. Instead all microbial samples/ organisms should be obtained from a science supplier/company and are limited to Biosafety Level 1 (BSL-1). The BSL-1 Checklist must be used to guide safe practices such as sealing Petri dishes, proper disposal, etc. Use of the Qualified Scientist Form and Designated Supervisor Form are required to ensure student's and others' safety. Forms are to be part of the daily log to be viewed by the judges.**

13. **Projects involving invertebrates (e.g. worms, daphnia, fruit flies, snails, insects, etc.) must have a clear purpose that has scientific significance. Invertebrates should be treated humanely, and intentionally harming them without scientific purpose should not occur.**

14. **Projects involving non-human vertebrates (including embryos, eggs, tadpoles, and other early life cycle stages of vertebrates) are held to a higher standard than projects testing invertebrates. Vertebrates must be treated humanely, and if a project could cause pain or distress to the vertebrate the student will need to design a new question and procedure. When non-human vertebrate animals are tested and their environment is changed, a Qualified Scientist Form and Designated Supervisor Form are required to ensure humane treatment. Forms will be retained at the school level. A project with a mortality rate of 30% or greater in any vertebrate groups or subgroup is not permitted to be entered into the Science Fair even if the deaths were unintentional or accidental.**

15. **In some cases, students may choose to use human subjects for their experiments. However, when an experiment could cause more than minimal risks to the human subject, the subjects (and their parents, when a minor) must be informed of, and consent to, the testing procedures before any experimentation begins. In these cases, use of the Qualified Scientist Form, Designated Supervisor Form and Informed Consent Form is required to ensure the safety of the human subjects. Forms will be part of the project package brought to the fair. For more details, see the online Risk Assessment Guide at www.societyforscience.org/isef/rulesandguidelines.**

16. **Student and school identifications must be removed from the project. All projects will be provided an identification label for the fair.**

17. **Student photos are permitted to be displayed. This is a parent and/ or school decision.**

18. **Students must be present on Judging Day for project interviews – no exceptions (tapes, videos, etc).**

19. **The school is responsible for the removal of all exhibits when fair is completed. The Committee will not be responsible for any exhibits left after the Fair closes.**

Experimenting Into The Future, Elementary (9-12) Science Fair

All 3-8 level guidelines will be followed. In addition, the following guidelines will be used in the process of screening and exhibiting projects for the *Experimenting Into The Future* Secondary Science Fair.

1. **Students engaging in scientific research and participating in a Science Fair must be aware that all research must be carried out safely and in compliance with health, safety, and environmental laws, regulations and standards at the local, state, national, and occasionally international level. Students are responsible for presenting supporting evidence for the safety design and production of scientific, non-subjective results. The project must include repeatable, quantitative results.**

2. **KSCVC and PBA require that all scientific research exhibited at the Science Fair be conducted in compliance with the laws, regulations, and standards of all existing laws. Students and teachers are responsible for obtaining copies of all forms and accompanying rules governing the type of research undertaken. In addition, students and teachers are responsible for checking with the respective city/town boards/commissions to find any established local rules that must be considered in the proposed research plan (particularly important in the area of recombinant DNA). Disposal of chemicals and bio-hazardous materials must be done according to local/state/federal regulations. Students, teachers, Qualified Scientists and Designated Supervisors must carefully scrutinize and adhere to all rules and regulations for safe research and display. All students must complete either an INDIVIDUAL CHECKLIST (1A) & RESEACH PLAN or APPROVAL FORM (1B) & CHECKLIST FOR TEAHCER (1) with the appropriate signatures prior to the start of the project. All students must meet with their teacher to complete and review these forms before experimentation begins. Each high school principal/science department chairperson and science teacher should make themselves aware of the rules and regulations of the "Experimenting Into The Future" Science Fair. Additional forms may be needed due to a project's topic, special equipment, special chemicals, etc. Please contact the Science Fair Committee Members.**

3. **Project displays are limited to:**
   A. Research and Daily Log – in front of project showboard
   B. Research data and other items should be displayed through the use of: Charts, Drawings, Graphs and Photographs
   C. 3-D objects are ***not*** to be exhibited on the showboard, except for foam letters
   D. Scientific Worth - in front of project showboard
   E. Experimental Report - in front of project showboard

4. **As in the Elementary Guidelines, samples/organisms should NOT be collected, isolated and/or cultured from the environment as they are potentially pathogenic. This includes, but not limited to, projects involving blood, growing mold and culturing swabs from the environment. Instead all microbial samples/ organisms should be obtained from a science supplier/company and are limited to Biosafety Level 1 and Level 2 (BSL-1 & 2). The BSL-1 & 2 Checklists must be used to guide safe practices such as sealing Petri dishes, proper disposal, etc. Use of the Qualified Scientist Form and Designated Supervisor Form are required to ensure student's and others' safety. Forms are to be part of the daily log to be viewed by the judges.**

Home Education Entry and Eligibility Requirements

ENTRY:

Home education students are welcome to participate in the “Experimenting Into The Future” Science Fair. Home education organizations will follow the same schedule of fair events with one exception. Home education science fair projects will be reviewed and judged at the local school level on November 2, 2013. Entry into the 2013 “Experimenting Into The Future” Science Fair will depend upon placement in the Home Education Science Fair event located at Palm Bay Academy.

All projects must follow the same guidelines as stipulated in this document. Any required forms must be filled out and submitted as directed in this document.

ELIGIBILITY:

Entry into the PBA sponsored Home Education Science Fair is dependent upon meeting all the following qualifications…

1. Be a home school student in a grade level, 3 through 12 as understood by Brevard County School Board standards
2. Live in Brevard, Florida during the 2013/2014 School Year
3. May not attend public schools (including on-line) or full-time private schools

FEES:

Each home education science fair entry is subject to a $20.00 fee, non-refundable, paid by check only to Palm Bay Academy. The fee covers entry into the Home Education Science Fair event and includes a PBA Science Fair T-Shirt. Entry into the “Experimenting Into The Future” Science Fair requires an additional fee of $30.00. Entry fee also includes a tee shirt.

NOTE:

Requirements will change as the “Experimenting Into The Future” Science Fair expands to include its expected geographical area. In the future, home education organizations may be required to enter as their own entity within the local area district science fairs prior to the PBA sponsored Home Education Science Fair. Additional fees may apply.

(Information on planning and running a science fair can be found on the Science Buddies and Discovery Education web sites. In order to participate in Regional and State Science Fairs, all science fairs must comply with the ISEF rules and regulations to insure that their work has been done safely and with supervision.)

HOME EDUCATION SCIENCE FAIR ENTRY FORM

One entry form per student

Entry fee is $20.00 (Entry fee includes a tee shirt)

Student Information

Last Name: _____ First Name: _____

Address: _____

City and Zip Code Grade: _____

Telephone: _____ Email: _____

Parent's Name: _____

Category – Choose 1 Grade Level and circle 1 category

_____ Grades 3 – 5

Experimental project (follows the scientific method) – interview by 2 or 3 judges, constructive comments, numerical rating, ribbon award.

Category (circle one) 1. Biological 2. Physical 3. Environmental

_____ Grades 6 – 8

Experimental project (follows the scientific method) – interview by 2 or 3 judges, constructive comments, numerical rating, ribbon award.

Category (circle one) 1. Biological 2. Physical 3. Environmental

_____ Grades 9 – 12

Experimental project (follows the scientific method) – interview by 2 or 3 judges, constructive comments, numerical rating, ribbon award.

Category (circle one) 1. Behavioral/Social Science 2. Engineering 3. Mathematics 4. Computer 5. Earth Science 6. Physics and Energy

Project Information

Name of project (or subject): _____

Description: _____

_____

_____

Special needs for display: _____

Talent Release

I hereby assign and grant to the PBA Home Education Science Fair Committee and the "Experimenting Into The Future" Science Fair Committee the right and permission to use and publish photographs and/or other electronic representations made of me or my child at the PBA Homeschool Science Fair Committee and the "Experimenting Into The Future" Science Fair Committee, and I hereby release the PBA Home Education Science Fair Committee and the "Experimenting Into The Future" Science Fair Committee and designees' any and all liability from such use and publications. I hereby authorize the reproduction, exhibit, broadcast, electronic storage, and/or distributions of said photographs and/or other electronic representation without limitations at the discretion of the PBA Home Education Science Fair Committee and the "Experimenting Into The Future" Science Fair Committee.

Circle one: Agree Do Not Agree Signed: _____ Date: _____

Please mail entry form and fee to [PBA Representative], 2112 Palm Bay Road NE, Palm Bay, FL 32905. Confirmation will be sent by email; if you do not have an email address please include a self-addressed stamped envelope or postcard.

Project scoring guide is divided by type of study: Collection, Observation, Model, Experiment, and Invention. Please use the correct scoring sheet for the experiment.

In addition to the scoring guide, please keep in mind the following…

1. Quality - how well the student understands the project and the area (s)he has chosen.
2. A project which involves laboratory or field work (not just research model building).
3. The level of the child's work – elementary, middle or high school student. All work has worth / value.
4. Project as compared to others in the same category and grade level.
5. Creative Ability - the elementary child may not incorporate as many creative aspects in his/her project or in as much depth as a middle or high school student. Try to determine what kind of assistance the student received and what the student contributed (no penalty for receiving help). EXAMPLE: Did (s)he get the idea from a book or did (s)he develop an idea as a result of reading. The student's idea is considered more creative. Collections are not creative unless they are used to support an investigation and help to answer a question in an original way. Engineering should not be a lot of gadgets but a genuine contribution – the most efficient way to solve a problem, etc…
6. Scientific Thought – is use of the scientific method evident
7. Thoroughness – was the project carried to completion, how much time was spent
8. Skill – does the student have the skills required to do the work
9. Clarity – has the child expressed themselves well in written work and during the presentation
10. Knowledge Gained – what was learned, was it interesting, would the student change anything

****Important:** All Judge's information regarding decisions, notes, point awards is strictly confidential. Please advise students that the Judging process does ***not*** include feedback from the Judges. All judging decisions are final.

Project Scoring Guide

Entry # format is…
Grade Level - Entry Receipt # (ie 3-47)

ENTRY NUMBER _____
ROW_____ POSITION _____
TOTAL SCORE: Elementary ____/100
Secondary ____/125

Display (15 points) **ALL EXHIBITS**

Display is easily viewed, faces forward, materials easily read in a top to bottom/left to right order. ____ / 2
All sections of study design are clearly labeled with bold print. ____ / 2
Attractive. Good use of color and graphic design. Very neat. ____ / 2
Clear and concise writing. Correct grammar and spelling (keep grade level in mind). ____ / 4
Creative approach - Evidence of student's original and creative input (unique display or an unusual topic or novel approach.) ____ / 5

Written Report (25 points) **SECONDARY PROJECTS ONLY**

Standard Sections
Background Information, Procedure, Results (with data tables and graphs), Conclusion/Scientific Worth, Bibliography, Experimental Report ____ /15

Correct Format
Writing style is clear, concise, and objective; report is neatly typed on 8.5" by 11" white, unlined paper; report is in either a folder or notebook; section titles are present. ____ /10

Judge Question & Answer Guidelines

Q: Refresh my memory on what an IV, DV, and CV are?
A: IV=Independent variable remember as the 'I vary variable' What was changed?
DV=Dependent variable remember as the 'data variable' What was watched and recorded?
CV=Constant variable or CC=constant conditions What needed to remain the same?

Q: By what standards should I judge projects?
A: Make sure that your expectations match the grade level. Be fair and follow the points recommend for each section. Remember to reward a student's curiosity and creativity.

Q: Can a student's name or picture be present on the project?
A: No. No names are allowed in the project or report and pictures may not show faces.

Q: Does the log book have to be hand-written?
A: It is preferred that it is hand-written, even messy, but this is not required.

Q: What do I do if the report is missing on a secondary project, but all parts are on the board?
A: They still lose the 25 points for the formal writing experience is required for 9-12 grades.

Collection Study (the purpose is to collect and identify a set of natural objects)

Log Book (15 points)
A start-to-finish, dated record of all work done on the project. ____ / 5
Includes personal thoughts, interviews, reading notes for background information. ____ / 5
Recorded plans, actions, data, observations and conclusions. ____ / 5

Background Information (10 points) Presented in the student's own words.
History of people and findings related to the topic (as appropriate). Significance of topic (What is important or valuable about this study? Why is it worth doing?) ____ / 4
Facts such as major terms and definitions and procedural information about special methods, equipment, or measurement units. ____ / 4
Minimum of three sources (Elementary) or five sources (Secondary). Works are cited in the bibliography using correct format. ____ / 2

Problem (or Purpose) (5 points)
Why is the collection being made? What question do you want to answer while collecting? ____ / 5

Hypothesis (or Prediction) (5 points)
An "I think I will find …" statement predicting specific results ____ / 5

Procedure (10 points)
Where, when and how of the study? List the steps to replicate the collection. ____ / 5
Explain how recording will be done. Uses metric units if measurements are involved. (Points are not deducted if metric units are not appropriate.) ____ / 5

Number of Items (10 points)
Enough items are collected to demonstrate diversity and respond to the problem. ____ /10

Identification (10 points)
All objects are labeled correctly. ____ /10

Results (10 points)
Diagram or table shows the use of characteristics to classify and identify items. ____ / 5
Diagram or table has title, labels and appropriate units. ____ / 5

Conclusion (5 points)
Statement describes what was learned and links to the background information. ____ / 5

Scientific Worth (5 points)
Student reflects on following the procedure and on improvements/extensions for future study. (These elements may be found in conclusion or log book. More in depth for 9-12.) ____ / 5

Subtotal _____
Display _____
TOTAL _____

Observation Study (the purpose is to find a pattern of events)

Log Book (15 points)

A start-to-finish, dated record of all work done on the project. ____ / 5
Includes personal thoughts, interviews, reading notes for background information. ____ / 5
Recorded plans, actions, data, observations and conclusions. ____ / 5

Background Information (10 points) Presented in the student's own words.

History of people and findings related to the topic (as appropriate). Significance of topic (What is important or valuable about this study? Why is it worth doing?) ____ / 4
Facts such as major terms, definitions and the event being observed and procedural information about special methods, equipment, or measurement units ____ / 4
Minimum of three sources (Elementary) or five sources (Secondary) Works are cited in the bibliography using correct format. ____ / 2

Problem (5 points)

Why are the observations being made? Clearly stated question about the IV-DV relationship. ____ / 5

Hypothesis (5 points)

An "If....., then...." statement that predicts the expected IV-DV relationship. ____ / 5

Procedure (10 points)

Includes the where, when and how of observations (CV), what IVs are selected to be observed, and DVs to be recorded. ____ / 5
All materials are listed with quantities needed for the entire observation. Uses metric units if measurements are involved. ____ / 5

Observations (20 points)

Actual observations (drawings and words) are included. ___ / 10
There is evidence that enough observations were used to support/not support expected outcome in hypothesis. ___ / 10

Results (10 points)

Diagram or table of organized observations shows the IV-DV pattern. ____ / 5
Diagram or table has title, labels and appropriate units. ____ / 5

Conclusion (5 points)

Statement describes what was learned and links to background information. ____ / 5

Scientific Worth (5 points)

Overall plan is thorough, follows plan, comments on consistency of data, gives possible future study. (These elements may be found in conclusion or log book. More in depth for 9-12.) ____ / 5

Subtotal _____
Display _____
TOTAL _____

Model Study (the purpose is to learn about an object by building a scale or functional model)

Log Book (15 points)

A start-to-finish, dated record of all work done on the project. ____ / 5
Includes personal thoughts, interviews, reading notes for background information. ____ / 5
Recorded plans, actions, data, observations and conclusions. ____ / 5

Background Information (10 points) Presented in the student's own words.

History of people and findings related to the topic (as appropriate). Significance of topic (What is important or valuable about this study? Why is it worth doing?) ____ / 4
Facts such as major terms, definitions and photo or drawing of the real object; procedural information about special methods, equipment, or measurement units. ____ / 4
Minimum of three sources (Elementary) or five sources (Secondary). Works are cited in the bibliography using correct format. ____ / 2

Problem (or Purpose) (5 points)

Why is the model being made? What question do you want to answer by building the model? ____ / 5

Hypothesis (or Prediction) (5 points)

An "I think my model will show …" statement that predicts how the model will be similar to the actual object or event ____ / 5

Procedure (10 points)

Includes where, when and how the model is built and whether it is a workable or scale model.
Procedure gives numbered steps that would allow exact duplication of the model. ____ / 5
Drawings will be completed for the model. All materials are listed with quantities needed. Uses metric units if measurements are involved. ____ / 5

Construction (20 points)

Photographs and log statements are made throughout the construction. ____ /10
The model demonstrates quality of design and construction. ____ /10

Results (10 points)

Model parts accurately relate to real object(s). ____ /5
Model is tested for workability or scale (Photographs showing scale and function). ____ /5

Conclusion (5 points)

Statement describes what was learned and links to background information. ____ / 5

Scientific Worth (5 points)

Student reflects on following the procedure and on improvements/extensions for future study. (These elements may be found in conclusion or log book. More in depth for 9-12.) ____ / 5

Subtotal _____
Display _____
TOTAL _____

Experiment Study (the purpose is to study a cause-effect relationship)

Log Book (15 points)

A start-to-finish, dated record of all work done on the project. ____ / 5
Includes personal thoughts, interviews, reading notes for background information. ____ / 5
Recorded plans, actions, raw data, observations and conclusions. ____ / 5

Background Information (10 points) Presented in the student's own words.

History of previous findings related to the topic (as appropriate). Significance of topic (What is important or valuable about this study? Why is it worth doing?) ____ / 4
Facts such as major terms, definitions and the process or cause-effect involved and procedural information about special methods, equipment, or measurement units. ____ / 4
Minimum of three sources (Elementary) or five sources (Secondary). Works are cited in the bibliography using correct format. ____ / 2

Problem (5 points)

Why are you doing this experiment? Clearly stated question about the IV-DV relationship ____ / 5

Hypothesis (5 points)

An "If....., then...." statement that predicts the expected IV-DV relationship. ____ / 5

Procedure (15 points)

Variables are clearly identified (What is the IV and how was it changed? What is the DV and how was it measured? What CV's were held constant?) ____ / 5
All materials are listed. Procedure gives numbered steps that would allow duplication of the experiment. May be found in report or log book. ____ / 5
Uses metric units if numerical measurements are involved. (Points are not deducted if metric units are not appropriate.) ____ / 5

Trials and Samples (10 points)

There is evidence that enough trials and samples (minimum of three repetitions) were used to support/not support expected outcome in hypothesis. ____ / 5
The control is identified, clearly described, and used as a comparison for at least three alterations of the IV. (Some experiments may not lend themselves to a control. Experimenters should not be penalized.) ____ / 5

Results (10 points)

Data table shows changes of the IV and data for the DV in each trial/sample. Data table has title, labels and appropriate units. ____ / 3
Graph shows IV-DV relationship). Graph title identifies the IV-DV relationship, shows IV on the x-axis and DV on the y-axis, and uses averaged values. Axes are correctly labeled and include units. ____ / 5
Written summary of results is included. ____ / 2

Conclusion (10 points)

Reaction to hypothesis is consistent with results. ____ / 5
Includes link to hypothesis and background information; explains significance of results. ____ / 5

Scientific Worth (5 points)

Student reflects on following the procedure and on improvements/extensions for future study. (These elements may be found in conclusion or log book. More in depth for 9-12) ____ / 5

Subtotal _____
Display _____
TOTAL _____

Invention Study (the purpose is a specification set for a model or experiment)-Mostly Engineering, Math, and Computer projects.

Log Book (15 points)

A start-to-finish, dated record of all work done on the project. ____ / 5
Includes personal thoughts, interviews, reading notes for background information. ____ / 5
Recorded plans, actions, data, observations and conclusions. ____ / 5

Background Information (10 points) Presented in the student's own words.

History of people and findings related to the topic (as appropriate). Significance of topic (What is important or valuable about this study? Why is it worth doing?) ____ / 4
Facts such as major terms and definitions and procedural information about special methods, equipment, or measurement units. ____ / 4
Minimum of three sources (Elementary) or five sources (Secondary). Works are cited in the bibliography using correct format. ____ / 2

Problem (or Purpose) (5 points)

Clearly stated question or statement of purpose for the invention ____ / 5

Hypothesis (or Prediction) (5 points)

And "I think my invention will be able to …" statement that predicts how my invention solves the problem. ____ / 5

Procedure (20 points)

Includes how the invention is designed and whether it is workable. ____ /10
All materials are listed with quantities needed. ____ / 5
List steps that indicate how controlled trials will be conducted as the invention is tested and modified. ____ / 5

Trials and Samples (10 points)

There is evidence that enough tests and/or samples (minimum of three repetitions) are used to support/not support expected outcome in hypothesis. ____ / 5
Uses a control (no invention/prior invention) to compare student invention ____ / 5

Results (10 points)

Graph shows modifications to the invention (IV) and the results (DV) in each trial. (Bar graph if IV is words; line graph if IV is numbers) ____ / 5
Graph has title, labels and appropriate units. Graph title identifies the IV-DV relationship, shows IV on the x-axis and DV on the y-axis, and uses averaged values. Axes are correctly labeled and include units. ____ / 3
Written summary of results is included. ____ / 2

Conclusion (5 points)

Statement describes what was learned and links to background information. ____ / 5

Scientific Worth (5 points)

Student reflects on following the procedure and on improvements/extensions for future study. (These elements may be found in conclusion or log book. More in depth for 9-12.) ____ / 5

Subtotal _____
Display _____
TOTAL _____

(SAMPLE)

BIOLOGICAL

SCIENCE FAIR ENTRY APPLICATION CARD

Name _____ Grade _____

School _____

Title of Project _____

Permission to Photo Yes No

- All work on this project, including research, experiments, design and building of this exhibit, is truly the work of this student.
- Proper supervision was used to ensure the safety of the student.
- Microbiology projects submitted to the Area Fair must have the proper forms on file at the school.

_____ _____

Signature of Parent or Guardian Teacher's Signature

_____

Student's Signature

SCIENCE FAIR ENTRY CARDS:

1. Distributed at the August meeting.
2. Make sure names are spelled correctly and are legible to read.
3. Submit completed cards at the **November 21, 2013** meeting.

Medals and ribbons will be awarded as follows:

THIRD through EIGTH Grade

Biological	**Physical**	**Environmental**
1 First Place	1 First Place	1 First Place
1 Second Place	1 Second Place	1 Second Place
1 Third Place	1 Third Place	1 Third Place
1 Fourth Place	1 Fourth Place	1 Fourth Place
1 Fifth Place	1 Fifth Place	1 Fifth Place

NINTH through TWELFTH Grade (additional categories)

Behavioral/Social	**Engineering**	**Mathematics**	**Computer**
1 First Place	1 First Place	1 First Place	1 First Place
1 Second Place	1 Second Place	1 Second Place	1 Second Place
1 Third Place	1 Third Place	1 Third Place	1 Third Place
1 Fourth Place	1 Fourth Place	1 Fourth Place	1 Fourth Place
1 Fifth Place	1 Fifth Place	1 Fifth Place	1 Fifth Place

Earth/Space	**Physics & Energy**
1 First Place	1 First Place
1 Second Place	1 Second Place
1 Third Place	1 Third Place
1 Fourth Place	1 Fourth Place
1 Fifth Place	1 Fifth Place

3 Divisions will receive awards

Gemini Division 3-5 = **45**
Apollo Division 6-8 = **45**
Orion Division 9-12 = 12**0**

Total number of Awards - **210**

All students entering the Science Fair will receive a Certificate of Participation

A plaque will be awarded to the ***BEST OF SHOW*** Projects in each category/ per division. Total number of Plaques = 27. Additional awards may be given to individual students, schools and/or general fair support from Community Partnerships or Business sponsors.

USE THE SCIENTIFIC METHOD TO SOLVE YOUR PROBLEM. Steps are:

1. Problem - state in question form
2. Hypothesis – predict results before experimentation
3. Materials – items used
4. Procedure – steps followed to test predictions
5. Results – what happens during the experiment (measurements)
6. Conclusion – compare results with hypothesis

Grade Level Requirements for Exhibits

3rd - 5th graders	Project, Daily Log, and a one page summary
6th - 8th graders	Project, Daily Log, one page summary, research and a bibliography

*__Project__ – refers to the backboard and any materials that are displayed.
*__Daily Log__ – refers to a notebook detailing the student's daily work and data.
*__Summary__ – one page briefly explaining the most important parts of the project.
*__Bibliography__ – is a listing of all resources used to obtain research information.

9th - 12th graders	Project, Daily Log, one page summary, research, bibliography, scientific worth, and experimental report

*__Scientific Worth__ – assess work, tell what the next step would be if you were to repeat the experiment or continue this study.
*__Experimental Report__ – a formal report presenting in detail, the purpose, process, and findings of an experiment.

EXHIBIT DIMENSIONS & Other Information

Exhibits must be confined to table space with limits of 4 feet in height**,** 2 feet in width, and 12 inches deep. Exhibits must be self- supporting. *NO display items in front of exhibit.* ONLY Research and Daily log. Students can bring display on judging day and take display with them when leaving judging session. **Board display items – refer to page 10, Item 11 and page 12, item 3.** Projects larger than size limitations will be disqualified at check-in area. Project label should be placed in the middle panel of show board.

Hypothesis	**Problem**	**Results**
Materials	**Graphs**	
Procedure	**Data** **Summary**	**Conclusion**

Hypothesis	**Problem**	**Results**
Materials	**Graphs**	**Conclusion**
Procedure	**Data** **Summary**	**Scientific Worth**

HOW TO DO A SCIENCE PROJECT
Step-by-Step *Suggestions and Help* for
Elementary Students, Teachers, and Parents
Brevard Public Schools

1. Get an Idea for Your Project

Find an area that interests you. You might want to look at a list of science fair categories to help decide. Talk over ideas with your family, teacher, or friends. Use TV commercials, magazines, newspapers, hobbies, sports, or books to get more ideas. Think about problems around the house that you would like to solve. You can even test household items.

2. Start a Daily Log

A detailed Daily Log with accurate records allows a scientist to describe their investigation so others can repeat it and try to replicate the results. Use a separate permanent bound or spiral notebook as your Daily Log and **divide it into two sections: "*Daily Work*" and "*Data.*"**

- In the ***Daily Work*** section write down all the things you do or think about concerning your project each day - like a diary. Write a **date for each entry** to show the day to day record of your progress while doing your project. Give details. Include your procedure, research, diagrams, changes to the experiment, bibliography, etc.
- In the ***Data*** section make charts **before** you start your testing. Record all measurements, readings, etc. in these charts **in ink as you measure them** during your testing. If you make a mistake draw a line through it and rewrite it. Do not erase or "white out." Data should not be recorded by typing. Record any and all other observations you make while testing also. A good scientist keeps careful, detailed records of findings and test results. Sometimes it's the unexpected observation that leads to a new discovery.

3. Do a Search for Background Information

Every scientist spends time getting background information. Use the library; write or call experts; write to companies and organizations; use the Internet* on your computer. Start keeping a bibliography with complete information on every source you used or tried to get. Good research will help you **become an expert** on your topic. As an expert, you will be able to make better hypotheses, plan better testing, and draw better conclusions. You'll also impress others with your knowledge when you share the results of your project with them.

4. State the Problem in a Question Form

This part (often used as a title) asks what you are trying to find or show in your investigation. Make sure your question or problem is one that can be **solved by testing**. It must involve more than a demonstration survey, or a collection. Don't confuse the use of "affect" (a verb) with "effect" (a noun).

5. State Your Hypothesis

The hypothesis is **an educated guess or a prediction** of what you think will happen during your experimentation. Use background information to help you prepare this prediction and to explain it. Be sure to write your hypothesis **before** you start your experiment. The results of the test you do later do not have to support the hypothesis in order for the experiment to be a success.

6. Design the Experiment

Determine the **procedure that you will follow to test your hypothesis** and record it in your Daily Log. The procedure should explain the steps to be followed in order to find the answer to your question or problem. Think about necessary safety precautions that will be taken. Make a complete list in your Daily Log of all the materials you will need.

- Identify the conditions (also called **Controls**) that will be kept the same during the experiment. These will help you run a fair, scientific test that will give you valid results.
- Identify the one factor you will change (on purpose) to get a result. This is called the **Independent variable** (Also called Experimental or Manipulated variable).
- Identify how your results will be measured. This is called the **Dependent variable** (also called Responding variable). It's important to have results that can actually be measured. Use measuring tools with metric units whenever possible.
- Most experiments have a **Control Group**. This is the group of subjects that is treated in the "normal" way so you can compare them to the Experimental Group (the group of subjects that have the one factor changed)

A good procedure is very detailed – like a good recipe. This makes it easy for other scientists to duplicate your experiment so they can verify your results.

7. Conduct the Experiment

Follow your procedure carefully to ensure fair, scientific testing. While testing, **record all data, in ink**, directly into your Daily Log. Don't write measurements on a piece of paper and then copy them into your log – this can lead to errors. Be accurate and exact as you observe, measure, describe, count, or photograph. **Work safely.** If necessary, make changes in your procedure and document them in your Daily Log.

8. Repeat the Procedure

The results will be more convincing and valid if you **repeat the experiment as many times as possible**. For example, an experiment that uses ten plants will give more valid results than one that tested only one or two plants. Testing and measuring the distance a car rolled down a ramp twenty times would be more valid than testing it only three times. Understand that an experiment must be repeated many times and yield consistent results before the results can be accepted.

9. Analyze the Data (Results)

Look at the measurements you recorded in your Daily Log closely. Think about the data and decide what the results mean. Try to find explanations for your observations. If possible, examine your results mathematically using percentages, mean, median, range, and modes. Be sure to know the meanings of these words if you use them. Construct graphs or tables that will go on your backboard to show the results more clearly. Charts and graphs can help us understand patterns of change. The data will help you decide whether your hypothesis is supported or should be rejected. Identify data that is contradictory or unusual and try to explain it in your conclusions.

10. Make Conclusions

Conclusions are statements telling what you found out or learned during your investigation. This is a very important part of your project since you probably learned a lot. They are based on the results of your experiment and your hypothesis. Explain how the data you collected supports your hypothesis. If the data doesn't support your hypothesis, explain why you reject your hypothesis. Explain what further testing might be done to better answer your original question. Through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas. Tell how people might apply your findings to everyday life. Can you explain any unusual findings from your testing?

11. Communicate Your Results in a Summary or Abstract

Scientists share their findings with other scientists. Write a **short, one-page, five-paragraph** summary (sometimes called an Abstract) that explains the most important parts of your project. An easy format to use is to **write one paragraph that summarizes each** of the following:

- **Problem or question**. State it and explain why you chose it.
- **Hypothesis**. Tell your prediction and explain why you thought it would happen.
- **Testing**. Give a general overview of your procedure telling how you used fair and testing. Tell about your variables, how you had repeated trials or multiple subjects, testing time, and if you had a control group.
- **Results**. Summarize your data by telling your final measurements, totals, or averages. Share a few of the most important observations you made. Compare your control group to your experimental group – did one do better than the other?
- **Conclusions**. State whether your hypothesis was supported by the data you collected or not. Tell the most important thing you learned. If the project was to be repeated what changes would you make and why?

Practice an oral presentation also. **Be an expert** on all parts of your project so you'll be prepared to answer an interviewer's or a classmate's questions.

12. Construct a Display that Explains Your Project

Here are some suggested parts you will want to include in your display. These will help you to organize your presentation and to communicate information about your project to others:

- **PROBLEM or QUESTION** - Statement of problem in question form.
- **HYPOTHESIS** - Your prediction of what will happen and your reasoning.
- **MATERIALS** -A complete list of materials and equipment you used.
- **PROCEDURE** -Step-by-step explanation of how you tested.
- **DATA or RESULTS** - Shows the information you collected by testing. Includes **graphs,** tables, charts, diagrams, or photographs.
- **CONCLUSION** - Statements relating your data to your hypotheses to tell what you learned by your testing.

Display your Daily Log, Summary or Abstract, and Bibliography on the table in front of your backboard.

13. Be ready to answer questions that judges often ask.

Below are sample questions that judges often ask students during judging interviews. It is a good idea to practice answering the following questions before meeting the judges:

- Can you explain or describe your project?
- What procedures did you follow that made sure it was a fair and scientific test?
- Where, or how, did you get the idea for your project?
- What kind of help did you receive while working on your project?
- What are the most important things you have learned by doing your project?
- If you had more time, what things would you do to change or improve your project?
- How much time did you spend working on your project?
- How can you apply what you have learned to "real life" situations?

Enter your project in the school science fair. Be sure to follow the rules. Set up your backboard,

Daily Log, Summary or Abstract, and Bibliography at the fair. Have fun showing others what you have learned!

*Use Internet sites for more information about science projects - go to:
http://elementarypgms.brevard.k12.fl.us/science_fairs.htm

"EXPERIMENTING INTO THE FUTURE" SCIENCE FAIR ENTRY FORM

One entry form per student (not for Home Education Science Fair)
Entry fee is $30.00 (Entry fee includes a tee shirt)

Student Information
Last Name: _____ First Name: _____

Address: _____

City and Zip Code Grade: _____

Telephone: _____ Email: _____

Parent's Name: _____

Category – Choose 1 Grade Level and circle 1 category
_____ Grades 3 – 5
Experimental project (follows the scientific method) – interview by 2 or 3 judges, constructive comments, numerical rating, ribbon award.

Category (circle one) 1. Biological 2. Physical 3. Environmental

_____ Grades 6 – 8
Experimental project (follows the scientific method) – interview by 2 or 3 judges, constructive comments, numerical rating, ribbon award.

Category (circle one) 1. Biological 2. Physical 3. Environmental

_____ Grades 9 – 12
Experimental project (follows the scientific method) – interview by 2 or 3 judges, constructive comments, numerical rating, ribbon award.

Category (circle one) 1. Behavioral/Social Science 2. Engineering 3. Mathematics 4. Computer
5. Earth Science 6. Physics and Energy

Project Information
Name of project (or subject): _____

Description: _____
_____
_____

Special needs for display: _____

Talent Release
I hereby assign and grant to the "Experimenting Into The Future" Science Fair Committee the right and permission to use and publish photographs and/or other electronic representations made of me or my child at the "Experimenting Into The Future" Science Fair Committee, and I hereby release the PBA, KSCVC, the Science Fair personnel, and the "Experimenting Into The Future" Science Fair Committee and designees' any and all liability from such use and publications. I hereby authorize the reproduction, exhibit, broadcast, electronic storage, and/or distributions of said photographs and/or other electronic representation without limitations at the discretion of the "Experimenting Into The Future" Science Fair Committee.

Circle one: Agree Do Not Agree Signed: _____ Date: _____

Please mail entry form and fee to [PBA Representative], 2112 Palm Bay Road NE, Palm Bay, FL 32905. Form and fee must be received by November 12, 2013. Confirmation will be sent by email; if you do not have an email address please include a self-addressed stamped envelope or postcard.

The recommended procedure for using the approval process is for the teacher to send home a copy of this form with each student to complete with parent guidance then carefully review the form before approving the project.

3-8 Science Project Research Plan and Approval Form

3-8 students designing their own experiments for science projects will need guidance to conduct safe and ethical science. **Teachers**, **students** and **parents** should work together to review and complete this form, so that everyone has a complete understanding of the intended project and is aware of any potentially dangerous or unethical situations *before* the student begins any testing. Each school should have a Science Fair Committee in place. Questions concerning this form and other science project concerns should be referred to the school Science Fair Committee

Name of Student _____ **Project Title** _____

Guidelines for practicing safe and responsible science for students, parents and teachers

- Students are **not** allowed to do projects that are clearly dangerous. Testing involving firearms, knives and other items that could be considered weapons is not permitted. Testing involving fireworks or other explosives is not allowed. Testing involving controlled substances, prescription drugs, alcohol, and tobacco is not allowed. The use of any potentially hazardous chemicals, devices, and activities require direct supervision by a Designated Supervisor.
- Microbial experimentation (involving microscopic organisms such as bacteria, fungi, etc.) done by elementary students is potentially dangerous and should only be done with expert and careful supervision. Samples/organisms should **not** be collected, isolated and/or cultured from the environment as they are potentially pathogenic. This includes, but is not limited to, projects involving blood, growing mold and culturing swabs from the environment**.** Instead, all microbial samples/organisms should be obtained from a science supplier/company and are limited to Biosafety Level 1 (BSL-1). The BSL-1 Checklist must be used to guide safe practices such as sealing Petri dishes, proper disposal, etc.
- Projects involving invertebrates (e.g. worms, daphnia, fruit flies, snails, insects, etc.) must have a clear purpose that has scientific significance. Invertebrates should be treated humanely and intentionally harming them without a scientific purpose should not occur.
- Projects involving non-human vertebrates (including embryos, eggs, tadpoles, and other early life cycle stages of vertebrates) are held to a higher standard than projects testing invertebrates. Vertebrates must be treated humanely, and if a project could cause pain or distress to the vertebrate the student will need to design a new question and procedure. A project with a mortality rate of 30% or greater in any vertebrate group or subgroup is not permitted to be entered into the Science Fair even if the deaths were unintentional or accidental.
- In some cases, students may choose to use human subjects for their experiments. However, when an experiment could cause more than minimal risks to the human subject, the subjects (and their parents, when a minor) must be informed of, and consent to, the testing procedures before any experimentation begins.
- Students should always follow approved procedures and never perform unauthorized experiments.

Note: These guidelines are adapted from the *Brevard County Secondary Science Research Guide* and the *Intel International Science and Engineering Fair Guidelines.*

Research Plan

What question will you be testing?_____

_____

Describe your plan and procedure(s) to test this question. Be sure to include enough detail to ensure that safe and responsible guidelines are being followed. _____

_____

_____

_____

_____

Approval Form

Does your project involve…

Microbial Experimentation?
Check: No ☐ Yes ☐
If yes, you must obtain teacher approval and complete a *Qualified Scientist Form* and a *Designated Supervisor Form* before any testing begins. *BSL-1 Checklist* must be used.

Non-Human Vertebrates whose environment is being changed?
Check: No ☐ Yes ☐
If yes, you must obtain teacher approval and complete a *Qualified Scientist Form* and a *Designated Supervisor Form* before any testing begins.

Human Subjects where there is more than minimal risk involved?
Check: No ☐ Yes ☐
If yes, before any testing begins you must obtain teacher approval and complete a *Qualified Scientist Form*, a *Designated Supervisor Form* and *Informed Consent Forms* when more than minimal risks are involved.
Visit www.societyforscience.org/isef/rulesandguidelines

NOTE: A qualified scientist is a medical doctor, veterinarian or individual with relevant science credentials. A science teacher, without these specific credentials, cannot be a "qualified scientist".

Does your project involve invertebrates (e.g. worms, daphnia, fruit flies, snails, insects, etc.)? Check: No ☐ Yes ☐
If yes, describe the purpose and scientific significance of your project: _____

_____

_____

Circle the category of this project: Biological Physical Environmental

Detailed descriptions of each category are in the Science Fair Handbook.
Teacher and/or Parent notes or concerns to be addressed: _____

_____

_____

I have read the guidelines and agree to follow the procedures of this Research Plan and Approval Form.

Student signature _____ **Date** _____

Parent signature _____ **Date** _____

Teacher Approval: ☐ **I do not approve this project, as currently planned.**

Notes and/or Suggestions: _____

_____

_____

_____

☐ **I approve this project.**

I will encourage the student to adhere to the guidelines and procedures of this Research Plan and Approval Form.

Teacher signature _____ **Date** _____

****It is recommended that teachers make a copy of this signed form for their own records and send the original home with the student. If a Qualified Scientist will be used the student must provide him/her with a copy of the Research Plan and Approval Form.**

The Intel International Science and Engineering Fair (Intel ISEF) website provides additional resources and guidelines that can be a valuable resource for students, teachers, and parents. Visit http://www.societyforscience.org/isef/rulesandguidelines

The recommended procedure for using the approval process is for the teacher to send home a copy of this form with each student to complete with parent guidance then carefully review the form before approving the project.

9-12 Science Project Research Plan and Approval Form

9-12 students designing their own experiments for science projects will need guidance to conduct safe and ethical science. **Teachers**, **students** and **parents** should work together to review and complete this form, so that everyone has a complete understanding of the intended project and is aware of any potentially dangerous or unethical situations *before* the student begins any testing. Each school should have a Science Fair Committee in place. Questions concerning this form and other science project concerns should be referred to the school Science Fair Committee

. **Name of Student** _____ **Project Title** _____

Guidelines for practicing safe and responsible science for students, parents and teachers

- Students are **not** allowed to do projects that are clearly dangerous. Testing involving firearms, knives and other items that could be considered weapons is not permitted. Testing involving fireworks or other explosives is not allowed. Testing involving controlled substances, prescription drugs, alcohol, and tobacco is not allowed. The use of any potentially hazardous chemicals, devices, and activities require direct supervision by a Designated Supervisor.
- Microbial experimentation (involving microscopic organisms such as bacteria, fungi, etc.) done by elementary students is potentially dangerous and should only be done with expert and careful supervision. Samples/organisms should **not** be collected, isolated and/or cultured from the environment as they are potentially pathogenic. This includes, but is not limited to, projects involving blood, growing mold and culturing swabs from the environment**.** Instead, all microbial samples/organisms should be obtained from a science supplier/company and are limited to Biosafety Level 1 & 2 (BSL-1 & 2). The BSL-1 & 2 Checklist must be used to guide safe practices such as sealing Petri dishes, proper disposal, etc.
- Projects involving invertebrates (e.g. worms, daphnia, fruit flies, snails, insects, etc.) must have a clear purpose that has scientific significance. Invertebrates should be treated humanely and intentionally harming them without a scientific purpose should not occur.
- Projects involving non-human vertebrates (including embryos, eggs, tadpoles, and other early life cycle stages of vertebrates) are held to a higher standard than projects testing invertebrates. Vertebrates must be treated humanely, and if a project could cause pain or distress to the vertebrate the student will need to design a new question and procedure. A project with a mortality rate of 30% or greater in any vertebrate group or subgroup is not permitted to be entered into the Science Fair even if the deaths were unintentional or accidental.
- In some cases, students may choose to use human subjects for their experiments. However, when an experiment could cause more than minimal risks to the human subject, the subjects (and their parents, when a minor) must be informed of, and consent to, the testing procedures before any experimentation begins.
- Students should always follow approved procedures and never perform unauthorized experiments.

Note: These guidelines are adapted from the *Brevard County Secondary Science Research Guide* and the *Intel International Science and Engineering Fair Guidelines.*

Research Plan

What question will you be testing?_____

_____

Describe your plan and procedure(s) to test this question. Be sure to include enough detail to ensure that safe and responsible guidelines are being followed. _____

_____

_____

_____

_____

Approval Form

Does your project involve…

Microbial Experimentation?	Non-Human Vertebrates whose environment is being changed?	Human Subjects where there is more than minimal risk involved?
Check: No ☐ Yes ☐ If yes, you must obtain teacher approval and complete a *Qualified Scientist Form* and a *Designated Supervisor Form* before any testing begins. *BSL-1/2 Checklists* must be used.	Check: No ☐ Yes ☐ If yes, you must obtain teacher approval and complete a *Qualified Scientist Form* and a *Designated Supervisor Form* before any testing begins.	Check: No ☐ Yes ☐ If yes, before any testing begins you must obtain teacher approval and complete a *Qualified Scientist Form*, a *Designated Supervisor Form* and *Informed Consent Forms* when more than minimal risks are involved. Visit www.societyforscience.org/isef/rulesandguidelines

NOTE: A qualified scientist is a medical doctor, veterinarian or individual with relevant science credentials. A science teacher, without these specific credentials, cannot be a "qualified scientist".

Does your project involve invertebrates (e.g. worms, daphnia, fruit flies, snails, insects, etc.)? Check: No ☐ Yes ☐
If yes, describe the purpose and scientific significance of your project: _____

_____

_____

Circle the category of this project: Behavioral/Social Science Engineering Mathematics

Computer Earth Science Physics and Energy

Detailed descriptions of each category are in the Science Fair Handbook.

Teacher and/or Parent notes or concerns to be addressed: _____

_____

_____

I have read the guidelines and agree to follow the procedures of this Research Plan and Approval Form.

Student signature _____ **Date** _____

Parent signature _____ **Date** _____

Teacher Approval: ☐ **I do not approve this project, as currently planned.**

Notes and/or Suggestions: _____

_____

_____

_____

☐ **I approve this project.**

I will encourage the student to adhere to the guidelines and procedures of this Research Plan and Approval Form.

Teacher signature _____ **Date** _____

****It is recommended that teachers make a copy of this signed form for their own records and send the original home with the student. If a Qualified Scientist will be used the student must provide him/her with a copy of the Research Plan and Approval Form.**

The Intel International Science and Engineering Fair (Intel ISEF) website provides additional resources and guidelines that can be a valuable resource for students, teachers, and parents. Visit http://www.societyforscience.org/isef/rulesandguidelines

QUALIFIED SCIENTIST FORM

To ensure that safe and ethical science is conducted, this form is required for research involving microbial experimentation. It is also required when non-human vertebrate animals are tested and their environment is changed, and when human subjects are tested and there is more than minimal risk involved for the subjects.

A Qualified Scientist is a medical doctor, veterinarian or individual with relevant science credentials. A science teacher, without these specific credentials, cannot be a "qualified scientist". This form must be signed prior to the start of the student's experimentation. *This form MUST be part of the student's project documentation available at the Fair*.

Student's Name _____

Title of Project _____

To be completed by the Qualified Scientist:

Scientist Name _____
Advanced Degree _____
Degree Specialty _____
Position _____
Address _____
Phone _____

- Students must provide a copy of their Science Project Research Plan and Approval Form to the Qualified Scientist.
- Students should always follow approved procedures and never perform unauthorized experiments.

1. Will microbial samples/organisms be used? **Yes** **No**

Microbial experimentation (involving microscopic organisms such as bacteria, fungi, etc.) done by elementary students is potentially dangerous and should only be done with expert and careful supervision. Samples/organisms should **not** be collected, isolated and/or cultured from the environment as they are potentially pathogenic. This includes, but is not limited to, projects involving blood, growing mold and culturing swabs from the environment**.** Instead, all microbial samples/organisms should be obtained from a science supplier/company and are limited to Biosafety Level 1 (BSL-1). The BSL-1 Checklist must be used to guide safe practices such as sealing Petri dishes, proper disposal, etc.

2. Will non-human vertebrates be used? **Yes** **No**

Projects involving non-human vertebrates (including embryos, eggs, tadpoles, and other early life cycle stages of vertebrates) are held to a higher standard than projects testing invertebrates. Vertebrates must be treated humanely, and if a project could cause pain or distress to the vertebrate, the student will need to design a new procedure. This form is required when changes are made to an organism's environment. A project with a mortality rate of 30% or greater in any vertebrate group or subgroup is not permitted to be entered into the Science Fair even if the deaths were unintentional or accidental.

3. Will human subjects be used? **Yes** **No**

When an experiment could cause more than minimal risks to a human subject, the subjects (and their parents, when a minor) must be informed of, and consent to, the testing procedures before any experimentation begins.

I certify that I have reviewed and approved the Research Plan prior to the start of experimentation. If the student or Designated Supervisor is not trained in the necessary procedures, I will ensure his/her training. I will provide advice and supervision during the research. I have a working knowledge of the techniques to be used by the student in the Research Plan. I understand that a Designated Supervisor is required when the student is not conducting experimentation under my direct supervision.

_____ _____
Qualified Scientist's Printed Name Signature of School Person Approving

_____ _____
Signature Date of Approval

The Intel International Science and Engineering Fair (Intel ISEF) website provides additional resources and guidelines that can be a valuable resource for students, teachers, and parents. Visit http://www.societyforscience.org/isef/rulesandguidelines

DESIGNATED SUPERVISORS FORM

To ensure that safe and ethical science is conducted, this form is required when a Qualified Scientist has been identified but may not be available to supervise experimentation. A "Designated Supervisor" is someone who agrees to oversee the experiment in the event the Qualified Scientist is not available to supervise. The Designated Supervisor must be trained by the Qualified Scientist to ensure the safety of the student and others. All animals must be treated in a humane manner. A project with a mortality rate of 30% or greater in any vertebrate group or subgroup is not permitted to be entered into the Science Fair even if the deaths are unintentional/accidental.

This form MUST be part of the student's project documentation available at the Fair.

Student's Name _____

Title of Project _____

To be completed by the Designated Supervisor:

Qualified Scientist Name _____
Advanced Degree _____
Degree Specialty _____
Position _____
Address _____
Phone _____

List or describe your responsibilities in supervising the student. Include all hazardous substances and devices used in the research and safety precautions to be employed: (Use back or attachments if necessary).

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

I certify that I have been trained in the techniques to be used by this student prior to the start of experimentation and that I will provide direct supervision.

_____ _____
Designated Supervisor's Printed Name | Signature of School Person Approving

_____ _____
Signature | Date of Approval

The Intel International Science and Engineering Fair (Intel ISEF) website provides additional resources and guidelines that can be a valuable resource for students, teachers, and parents. Visit http://www.societyforscience.org/isef/rulesandguidelines

INFORMED CONSENT FORM

To ensure that safe and ethical science is conducted, this form is required when an experiment could cause more than minimal risks to the human subject. The subjects (and their parents, when a minor) must be informed of, and consent to, the testing procedures before any experimentation begins. Use a separate form for each test subject. *This form MUST be part of the student's project documentation available at the Fair*. For more details, see the online Risk Assessment Guide at www.societyforscience.org/isef/rulesandguidelines

Student Researcher's Name _____
Grade _____
School _____
Title of Project _____

To be completed by the Student Researcher:

1) What are the research procedures in which the subject will be involved? _____

_____

_____

_____

2) What are the possible discomforts that may reasonably be expected by participating in this research?

_____

_____

_____

3) What procedures will be used to minimize risks? _____

_____

_____

_____

Adult Sponsor's Printed Name	**Signature**	**Phone**
Qualified Scientist's Printed Name	**Signature**	**Date Signed**
Title	**Institution**	**Phone**

To be completed by human subject prior to experimentation:

☐ I have read and understand the conditions stated above, and I consent to participate in this research procedure. I realize I am free to withdraw my consent and to withdraw from this activity at any time.

☐ I consent to the use of visual images (e.g. photographs, video) involving my participation in this research project (optional).

Participant's Printed Name	**Signature**	**Date Signed**

If participant is under 18 years old, a parent/guardian signature is required. If the subject of this experiment or parent/guardian has any questions about this experiment, the Adult Sponsor should be contacted.

I have received and reviewed a copy of any test, survey or questionnaire used in the research. ☐ **Yes** ☐ **No**

Parent's/Guardian's Printed Name	**Signature**	**Date Signed**

The Intel International Science and Engineering Fair (Intel ISEF) website provides additional resources and guidelines that can be a valuable resource for students, teachers, and parents. Visit http://www.societyforscience.org/isef/rulesandguidelines

ISEF Guidelines for Biosafety Level 1
Laboratory Facilities & Operations

A Self- Assessment Safety Checklist

This form is intended to aid in assessing a laboratory as appropriate to do BSL 1 studies in locations such as water testing facilities, high schools or colleges teaching introductory microbiology classes. The following checklist is based on the Biosafety Level 1 section of "Laboratory Biosafety Manual", 3rd edition, World Health Organization, 2004.

Facility Name _____ **Room #** _____

Address _____

_____

- **Name of Laboratory Supervisor/Teacher**_____
  - This person must be educated, trained and qualified to supervise microbiological projects and maintain the criteria below.
  - Qualifications: (List or attach additional sheet if necessary. Qualifications should include general training in microbiology or a related science)

_____
_____
_____
_____
_____
_____

I attest that I have the qualifications listed above (or attached).

I attest that there will be direct supervision of students when they are in the laboratory.

Laboratory Supervisor/Teacher Signature_____

Date of signature _____

- **Name of Responsible Administrator** _____

I attest that this laboratory is a BSL 1 facility and complies with all procedures listed on this form and that the person named above is educated, trained and qualified to supervise microbiological projects and maintain the criterion below.

Administrator Signature _____

Title _____

Date of Signature _____

Check the appropriate box for each statement.

If you check any of the following boxes with "NO", you must make appropriate modifications before you can classify the lab as a BSL 1 facility. The safety of students and faculty must be your primary concern.

A. Laboratory Practices

Yes	No	
☐	☐	1. All personnel wash their hands after they handle viable materials and animals, after removing gloves, and before leaving the laboratory.
☐	☐	2. Eating, drinking, handling contact lenses, and applying cosmetics is forbidden in the laboratory.
☐	☐	3. Mouth pipetting is prohibited and only mechanical pipetting devices are used.
☐	☐	4. All procedures are performed to minimize the creation of splashes or aerosols.
☐	☐	5. Work surfaces are decontaminated with disinfectant when work is completed at the end of the day and after any spill of viable material.
☐	☐	6. All contaminated cultures, stocks, glassware, plastic ware and other biologically contaminated waste are autoclaved or decontaminated with a suitable disinfectant.
☐	☐	7. Culture fluids and other contaminated liquid wastes are autoclaved or decontaminated with a suitable disinfectant before disposal.
☐	☐	8. Materials to be decontaminated outside of the laboratory are placed in a durable, leak-proof container and closed for transport from the laboratory.
☐	☐	9. Insect and rodent control procedures are in effect.

.

B. Personal Protective Equipment

Yes	No	
☐	☐	1. Protective laboratory coats/aprons are worn while in the laboratory and left in the laboratory after use. These coats are never taken from the laboratory without prior autoclaving or disinfection.
☐	☐	2. Suitable disposable gloves (e.g., latex, nitrile, vinyl) must be worn.
☐	☐	3. Goggles are available and used when required.

C. Laboratory Facilities

Yes	No	
☐	☐	1. The laboratory has a sink for hand washing.
☐	☐	2. The laboratory is designed so that it can be easily cleaned and decontaminated. (Carpets and rugs are not appropriate)
☐	☐	3. Bench tops are impervious to water and resistant to moderate heat, acids, alkalis, organic solvents and chemicals used to decontaminate the work surface.
☐	☐	4. The laboratory furniture is sturdy with surrounding spaces accessible for cleaning.
☐	☐	5. If the laboratory has windows that are open, they are fitted with fly screens.
☐	☐	6. Sharps are discarded in a puncture-resistant sharps disposal container.
☐	☐	7. A fire extinguisher and first aid supplies are easily accessible within the laboratory
☐	☐	8. An eyewash facility is easily accessible within the laboratory.

Check the appropriate box for each statement.

Yes	No	
☐	☐	1. The laboratory has a **Class II Biological Safety Cabinet** designed with inward air flow at a velocity to protect personnel (75-100 linear feet/minute), HEPA-filtered downward vertical laminar airflow for product protection, and HEPA-filtered exhaust air for environmental protection.
☐	☐	2. **Access to the laboratory is strictly limited** when BSL 2 experiments are in progress. When BSL2 experiments are not in progress, **BSL2 materials are locked** and the hood and surrounding area is decontaminated.
☐	☐	3. The biological safety cabinets is certified annually, when cabinets are moved, or when HEPA filters are changed.
☐	☐	4. Face protection (goggles, mask, face shield or other platter guards) are used for anticipated splashes or sprays of infectious or other hazardous materials to the face.

A. Standard Microbiological Practices

Yes	No	
☐	☐	1. All personnel wash their hands after they handle viable materials and animals, after removing gloves, and before leaving the laboratory.
☐	☐	3. Eating, drinking, handling contact lenses, and applying cosmetics is forbidden in the laboratory.
☐	☐	4. Mouth pipetting is prohibited and only mechanical pipetting devices are used.
☐	☐	5. All procedures are performed to minimize the creation of splashes or aerosols.
☐	☐	6. Work surfaces are decontaminated with disinfectant when work is completed at the end of the day and after any spill of viable material.
☐	☐	7. All contaminated cultures, stocks, glassware, plastic ware and other biologically contaminated waste are treated as bio hazardous material to be autoclaved.
☐	☐	8. Culture fluids and other contaminated liquid wastes are autoclaved or decontaminated with a suitable disinfectant before disposal.
☐	☐	9. Sharps are discarded in puncture-resistant sharps disposal containers and treated as medical waste. (Sharps include hypodermic syringes and needles, Pasteur pipettes, razor blades, contaminated broken glass and blood vials.)
☐	☐	10. Materials to be decontaminated outside of the laboratory are placed in a durable, leak-proof container and closed for transport from the laboratory.
☐	☐	11. Insect and rodent control procedures are in effect.

B. Special Practices

Yes	No	
☐	☐	1. Persons who are at an increased risk of acquiring infection or for whom infection may be unusually hazardous (e.g., immuno compromised, immuno suppressed, pregnant) are not allowed to enter the laboratory when BSL 2 work is in progress.
☐	☐	2. The laboratory supervisor has developed an annually reviewed and updated BSL 2 Biosafety manual that is posted in the lab.
☐	☐	3. There is documentation that students are trained and made aware of hazards and appropriate precautions before working in the laboratory.

ISEF Guidelines for Biosafety Level 2
Laboratory Facilities & Operations

A Self- Assessment Safety Checklist

This form is intended to aid in assessing a laboratory as appropriate to do BSL-2 studies in locations other than a registered research institution (e.g. high school laboratory, medical office, diagnostic lab). The following checklist is based on the Biosafety Level 2 section of "Laboratory Biosafety Manual", 3rd edition, World Health Organization, 2004.

Facility Name _____ **Room #** _____

Address _____

_____

- **Name of Laboratory Supervisor/Teacher**_____
    - This person must be educated, trained and qualified to supervise microbiological projects and maintain the criteria below.
    - Qualifications: (List or attach additional sheet if necessary. Qualifications should include significant course work in microbiology and/or significant related experience)

_____
_____
_____
_____
_____

I attest that I have the qualifications listed above (or attached).

Laboratory Supervisor/Teacher Signature_____

Date of signature _____

- **Name of Responsible Administrator** _____

I attest that this laboratory is a BSL2 facility and complies with all procedures listed on this form and that the person named above is educated, trained and qualified to supervise microbiological projects and maintain the criterion below.

Administrator Signature_____

Title_____

Date of signature _____

- **If you check any of the following boxes with "NO", you must make appropriate modifications before you can classify the lab as a BSL2 facility. The safety of students and faculty must be your primary concern.**

Yes No

☐ ☐ 4. There are established policies and procedures which limit entrance to the lab to individuals who are advised of the potential hazards and are appropriately trained.

☐ ☐ 5. There is a hazard warning sign (e.g., biohazard warning symbol) posted on the access door to the laboratory. The sign should identify the Biosafety level, the name and the telephone number of the laboratory supervisor or other responsible person(s), special requirements and items prohibited, and personal protective equipment required for entry.

☐ ☐ 6. A biohazard symbol is placed on equipment (e.g., incubators, freezers) where biohazardous materials are used or stored.

☐ ☐ 7. Spills and accidents are immediately reported to the laboratory supervisor and an incident report submitted.

C. Safety Equipment (Primary Barriers)

Yes No

☐ ☐ 4. Protective laboratory coats are worn while in the laboratory and then removed and left in the laboratory after use. These coats are never taken home for laundering. They are either disposed of or laundered by the school.

☐ ☐ 5. When required, suitable gloves (e.g., latex, nitrile, vinyl) are worn and appropriately disposed of after use.

D. Laboratory Facilities (Secondary Barriers)

Yes No

☐ ☐ 1. The laboratory has a sink for hand washing.

☐ ☐ 2. The laboratory is designed so that it can be easily cleaned and decontaminated. (Carpets and rugs are not appropriate)

☐ ☐ 3. Bench tops are impervious to water and resistant to moderate heat, acids, alkalis, organic solvents and chemicals used to decontaminate the work surface.

☐ ☐ 4. The laboratory furniture is sturdy and capable of supporting anticipated loads and uses.

☐ ☐ 5. The spaces between benches, cabinets, and equipment are accessible for cleaning.

☐ ☐ 6. Storage space is adequate to hold supplies for immediate use and thus prevent clutter on bench tops and in aisles.

☐ ☐ 7. Long-term storage space is available outside of the laboratory work.

☐ ☐ 8. Vacuum lines, if present, are protected with liquid disinfectant traps, or HEPA or hydrophobic filters.

☐ ☐ 9. If the laboratory has windows that are open, they are fitted with fly screens.

☐ ☐ 10. The laboratory doors are kept closed whenever work with biohazardous materials is conducted.

☐ ☐ 11. The laboratory is locked when not in use.

☐ ☐ 12. An autoclave is available.

☐ ☐ 13. An eyewash facility is readily available within the laboratory.

2013 NASA/Palm Bay "Experimenting Into The Future" Science Fair Student Checklist (1A) - Individual

Every student must fill out this entire form before beginning project experimentation.

READ INSTRUCTIONS ON PAGE 2 BEFORE COMPLETING YOUR RESEARCH PLAN
Contact the Science Fair Committee by e-mail at moored@palmbayacademy.org
Project year includes research conducted over a maximum, continuous 12-month period between March 2012 and June 2013.

PLEASE PRINT OR TYPE

Student Name _____ Grade _____ Gender: ☐ M ☐ F

Home Address _____ Apt # _____ City _____ State _____ Zip Code _____

Home Telephone _____ Email Address _____

School _____ School Telephone _____

School Address _____ City _____ State _____ Zip Code _____

Grades entered in REGIONAL FAIR: ☐6 ☐7 ☐8 ☐9 ☐10 ☐11 Grades entered in MSSEF: ☐6 ☐7 ☐8 ☐9 ☐10 ☐11

Project Title _____

1. Is this a continuation from a previous year? (Check one) ☐YES ☐NO Teacher's Name: _____
   If Yes:
   a) Attach previous year(s) ☐**Abstract** and ☐**Research Plan**
   b) Explain how this project is new and different from previous years on ☐**Continuation Form (7) - available upon request**

2. **This year's** laboratory experiment/data collection: **(must be stated (mm/dd/yy)**
   Start Date: _____ End Date: _____

3. Where will you conduct your experimentation? (Check all that apply)
   ☐ Research Institution ☐ School ☐ Field ☐ Home ☐ Other _____

4. List name, address, and phone number of all work site(s) other than school and home:
   Name: _____ _____
   Address: _____ _____
   _____ _____
   Phone: _____ _____

5. Complete a Research Plan following the Research Plan instructions and attach to this form.

REFER TO CONSENT FORM CHECKLIST ON THE WEBSITE (www.scifair.com) FOR ADDITIONAL FORMS FOR RESTRICTED AREAS BELOW.

The following areas of study require approval from the Regional Scientific Review Committee (SRC) before experimentation begins. Refer to the MSSEF Manual for definitions. A qualified scientist and/or designated supervisor must be named and appropriate forms filled out (Forms 2/3). *Check all items to be used in your research.*

Hazardous Chemicals, Activities or Devices
Form 1, 3 [1C, 2, if required]
_____ Carcinogenic or Mutagenic Chemicals
_____ Nuclear Radiation or Radioactive Substances
_____ Highly Toxic or Explosive Chemicals (check MSDS)
_____ High Voltage Equipment
_____ Ionizing Radiation
_____ Welding Equipment
_____ Lasers (Class II-IV)
_____ Firearms
_____ Controlled Substances (DEA chemicals, prescription drugs, alcohol, tobacco, etc.)

_____ **Research Performed in an Industrial/Institutional Setting**
Form 1, 1C, 2 or 3 [6A, 6B, if required]

The following areas of study require approval from the Regional Scientific Review Committee (SRC) before experimentation begins, and also require that you attach the appropriate Consent Forms to the Student Checklist (1A) & Research Plan. *Check all items to be used in the research.*

_____ **Potentially Hazardous Biological Agents**
Form 1, 2, 6A [1C, 3 if required]
_____ **Vertebrate Animals**
Form 1, 2, 5A or 5B [1C, 3, if required]
_____ **Human/Animal Tissue**
Form 1, 2, 6A, 6B [1C, 3 if required]
_____ **Human Participants/Subjects** (including surveys & studies)

An Institutional Review Board (IRB) should review all protocols before forms are sent to the SRC.
Form 1, 2, 4, MSSEF Informed Consent Form [1C, 3, if required]

All bacteria, fungi, etc. isolated from the environment should be considered potentially hazardous biological agents.
Submit a **copy** of completed form(s) to the SRC Committee for approval

I have read the material in these boxes AND:
☐ **my research does NOT involve any of the above.**
☐ **my research involves one or more of the above.**

Signature: _____ **Date:** _____

Research Plan Instructions

REQUIRED for ALL Projects Before Experimentation

A complete research plan is required and must accompany Checklist for Student (1A)

**

Provide a typed research plan and attach to Student Checklist (1A). Please include your name on each page. The research plan for ALL projects is to include the following:

A. Question or Problem being addressed
B. Hypothesis/Goals/Expected Outcomes
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 that answer research question or hypotheses41`

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.
- **APA** Format is recommended to reference the literature used in the research plan
- **Guidelines** can be found in the Manual

Items 1-4 below are subject-specific guidelines for additional items to be included in your research plan as applicable:

1. **Human subjects research:**
- **Subjects**. Describe who will participate in your study (age range, gender, racial/ethnic composition). Identify any vulnerable populations (minors, pregnant women, prisoners, mentally disabled or economically disadvantaged).
- **Recruitment**. Where will you find your participants? How will they be invited to participate?
- **Methods**. What will participants be asked to do? Will you use any surveys, questionnaires or tests? What is the frequency and length of time involved for each subject?
- **Risks**. What are the risks or potential discomforts (physical, psychological, time involved, social, legal, etc.) to participants? How will you minimize the risks?
- **Benefits**. List any benefits to society or each participant?
- **Protection of Privacy**. Will any identifiable information (e.g., names, telephone numbers, birthdates, email addresses) be collected? Will data be confidential or anonymous? If anonymous, describe how the data will be collected anonymously. If not anonymous, what procedures are in place for safeguarding confidentiality? Where will the data be stored? Who will have access to the data? What will you do with the data at the end of the study?
- **Inform/ed Consent Process**. Describe how you will inform participants about the purpose of the study, what they will be asked to do, that their participation is voluntary and they have the right to stop at any time.

2. **Vertebrate animal research:**
- Briefly discuss **POTENTIAL ALTERNATIVES** to vertebrate animal use and present a detailed justification for use of vertebrate animals
- Explain potential impact or contribution this research may have (see rules)
- Detail all procedures to be used
  - Include methods used to minimize potential discomfort, distress, pain and injury to the animals during the course of experimentation. Under Massachusetts Law, an animal cannot be put under duress/stress. This greatly limits what can be done in a vertebrate animal project.
  - Detailed chemical concentrations and drug dosages. Very strict rules apply. No animal's normal diet can be interrupted, etc. See rules.
- Detail animal numbers, species, strain, sex, age, source, etc.
  - Include justification of the numbers planned for the research
- Describe housing and oversight of daily care
- Discuss disposition of the animals at the termination of the study

3. **Potentially Hazardous Biological Agents (see rules):**
- Describe Biosafety Level Assessment process and resultant BSL determination
- Give source of agent, source of specific cell line, etc.
- Detail safety precautions
- Discuss methods of disposal

4. **Hazardous Chemicals, Activities & Devices:**
- Describe Risk Assessment process and results
- Detail chemical concentrations and drug dosages
- Describe safety precautions and procedures to minimize risk
- Discuss methods of disposal

Approval Form (1B)

A completed form is required for each student, including all team members.

1) To Be Completed by Student and Parent

a) Student Acknowledgment:

- I understand the risks and possible dangers to me of the proposed research plan.
- I have read the "Experimenting Into The Future" Science Fair Handbook and the Intel Rules and Guidelines and will adhere to all local and international rules when conducting this research.
- I have read and will abide by the following ethics.

Scientific fraud and misconduct are not condoned at any level of research or competition. Such practices include plagiarism, forgery, use or presentation of other researcher's work as one's own, and fabrication of data. Fraudulent projects will fail to qualify for competition in affiliated fairs and the Intel ISEF.

Student's Printed Name | Signature | Date Acknowledged (mm/dd/yy) (Must be prior to experimentation.)

b) Parent/Guardian Approval: I have read and understand the risks and possible dangers involved in the **Research Plan**. I consent to my child participating in this research.

Parent/Guardian's Printed Name | Signature | Date Acknowledged (mm/dd/yy) (Must be prior to experimentation.)

2) To be completed by the "Experimenting Into The Future" Science Fair Committee (SRC/IRB).

(Required for projects requiring prior Science Fair Committee approval)

a) Required for projects that need prior SRC/IRB approval BEFORE experimentation (humans, vertebrates or potentially hazardous biological agents)

The SRC/IRB has carefully studied this project's **Research Plan** and all the required forms are included. My signature indicates approval of the **Research Plan** before the student begins experimentation.

SRC/IRB Chair's Printed Name

Signature | Date of Approval (mm/dd/yy) (Must be prior to experimentation.)

OR

b) Required for research conducted at all Regulated Research Institutions with no prior fair SRC/IRB approval.

This project was conducted at a regulated research institution (**not home or high school, etc.**), was reviewed and approved by the proper institutional board before experimentation and complies with the Intel ISEF Rules. **Attach (1C) and required institutional approvals (e.g. IACUC, IRB)**

SRC Chair's Printed Name

Signature | Date of Approval (mm/dd/yy)

3) Final Intel ISEF Affiliated Fair SRC Approval **(Not required at this time.)**

SRC Approval After Experimentation and Before Competition at Regional/State/National Fair

I certify that this project adheres to the approved **Research Plan** and complies with all Intel ISEF Rules.

Regional SRC Chair's Printed Name | Signature | Date of Approval

State/National SRC Chair's Printed Name *(where applicable)* | Signature | Date of Approval

Checklist for Teacher (1)

This completed form is required for ALL projects

To be completed by the Teacher in collaboration with the student researcher(s):

Student's Name(s): _____

Project Title: _____

1) ☐ I have reviewed the MSSEF/ISEF Rules and Guidelines.

2) ☐ I have reviewed the student's completed Student Checklist (1A) and Research Plan.

3) ☐ I have worked with the student and we have discussed the possible risks involved in the project.

4) ☐ The project involves one or more of the following and requires prior approval by Science Fair Committee:

☐ Humans

☐ Vertebrate Animals

Potentially Hazardous Biological Agents:

☐ Microorganisms ☐ DNA ☐ Tissues

5) Forms to be completed for **ALL Projects:**

☐ Teacher Checklist (1) ☐ Research Plan

☐ Student Checklist (1A) ☐ Approval Form (1B)

☐ Regulated Research Institutional/Industrial Setting Form (1C) (when applicable after completed experiment)

☐ Continuation Form (7) (when applicable – available upon request)

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6) **Additional forms required if the project includes the use of one or more of the following** (check all that apply):

☐ **Humans** (Requires prior approval by an Institutional Review Board (IRB) and Scientific Review Committee (SRC))

- ☐ Human Participants Form (4) and MSSEF Informed Consent Form
- ☐ Qualified Scientist Form (2) (when applicable and/or required by the IRB and SRC)

☐ **Vertebrate Animals** (Requires prior approval, see rules)

- ☐ Vertebrate Animal Form (5A) - for projects conducted in a school/home/field research site (SRC prior approval required)
- ☐ Vertebrate Animal Form (5B) - for projects conducted at a Regulated Research Institution. (Institutional Animal Care and Use Committee (IACUC) approval required prior to experimentation. SRC prior approval required)
- ☐ Qualified Scientist Form (2) (Required for all vertebrate animal projects at a regulated research site or when applicable)

☐ **Potentially Hazardous Biological Agents** (Requires prior approval by SRC, IACUC, or Institutional Biosafety Committee (IBC), see rules)

- ☐ Potentially Hazardous Biological Agents Risk Assessment Form (6A)
- ☐ Human and Vertebrate Animal Tissue Form (6B) - to be completed in addition to Form 6A when project involves the use of fresh or frozen tissue, primary cell cultures, blood, blood products and body fluids.
- ☐ Qualified Scientist Form (2) (when applicable)
- ☐ Risk Assessment Form (3) Required for projects involving protists, archae and similar microorganisms, for projects using manure for composting, fuel production or other non-culturing experiments, for projects using color change coliform water test kits and for projects involving decomposing vertebrate organisms.

☐ **Hazardous Chemicals, Activities and Devices** (Requires prior approval, see rules)

- ☐ Risk Assessment Form (3)
- ☐ Qualified Scientist Form (2) (required for projects involving DEA-controlled substances or when applicable)

Teacher's Printed Name	Signature	Date of Review (Must be prior to experimentation)

Phone	Email