

LA County Science & Engineering Fair

Largest and longest running Regional Science & Engineering Fair in the nation





Who Can Enter?

 Awards and scholarships in 38 categories ranging from Biology to Engineering to Zoology

 Open to Grade 6-12 students attending LA County Public and Private Schools

 Must compete in a local school or district science fair in order to qualify for regional competition





Team Projects

- No more than THREE people per team
 - <u>Why</u> does this need to be a *team* project?
 - Every team member should have a <u>unique</u> contribution to the project and be able to justify their participation







 Opportunities to apply creativity and critical thinking to solve problems beyond the classroom.



- Publicly recognize achievements
- Opportunities for professional leaders to network with students & educators
- Promote school-community cooperation in developing scientific potential and communication skills





Regulations

- Students entries from grades 6 -12 only
- Research design based on scientific methodology or engineering principles



 IF the project involves tissues/cell lines, human subjects, vertebrate animals, ADDED hazardous chemicals or microbes, proper paperwork <u>must be submitted ONLINE (new</u> <u>webpage) and pre-approved</u> by the LA Science Fair *BEFORE* beginning the research itself.





- Prescreened by the teacher and Science Fair Coordinator at the school
- Adhere to all federal, state, and local laws
- Work of the entrant and work of others is clearly distinguished
- Projects to remain during designated times



Display be self-supporting and not collapse



- **Display fits** within the prescribed space
- Uses a title descriptive of your study

 Subtitles may be used for clarification
- <u>NO</u> live animals or plants
- <u>NO</u> tissues or microorganisms on display (use pictures or a model instead...)
- <u>NO</u> photos which show procedures hurtful to <u>vertebrate</u> animals.



Display Regulations

- Equipment that is small or expensive should be brought to an interview and removed promptly – you may leave a note to tell judges of your equipment.
- ALL equipment is left
- Give attention to safety

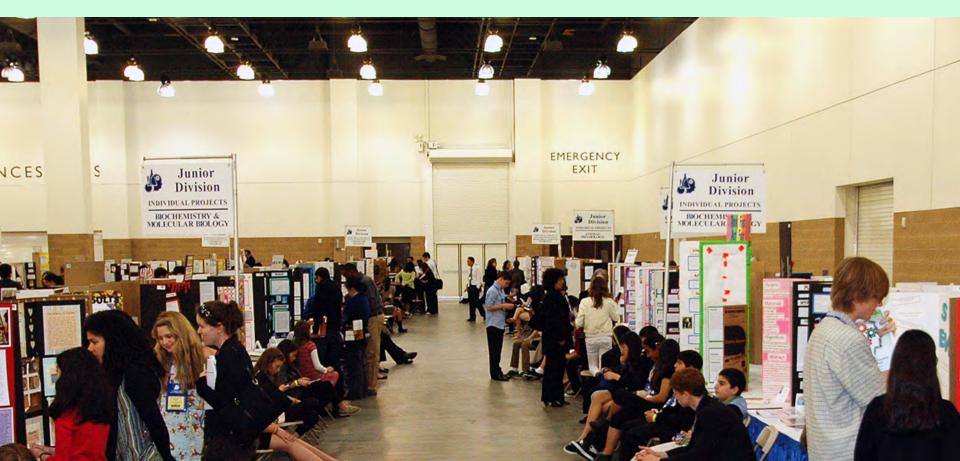
Decision of the Science Fair Committee is final

RISK



Fair Categories

- 22 Junior Project categories
- 15 Senior Project categories



Animal Biology

- Evolutionary origins
- Genetics
- Growth
- Morphology
- Studies of animals in their natural habitat



Animal Physiology

- Studies of major organ system functions involving:
 - Genetics Sensory biology
 - Immunology
 - Neurobiology
 - Pathology
 - Reproduction



Behavioral/ Social Sci - Human

- Psychology
- Human Behavior/Attitudes
- Linguistics
- Societal Values
- Ethnology
- Learned responses
- Chemical & Physical Stress
- Reading Problems



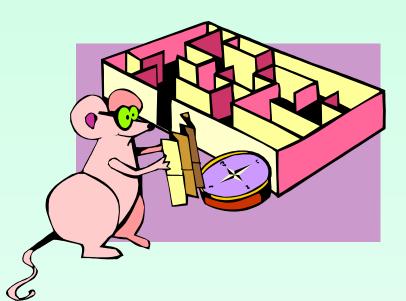


Behavioral/ Social Sci – Non-human

- Psychology
- Perception
- Animal Behavior
- Linguistics
- Archaeology
- Ethnology
- Learning

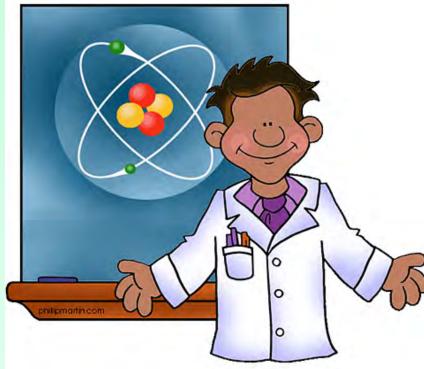


- Educational Testing
- Reading Problems



Biochemistry & Molecular Biology

- Molecular biology
- Molecular genetics
- Enzymes & Hormones
- Photosynthesis
- Blood chemistry
- Protein chemistry
- Food chemistry



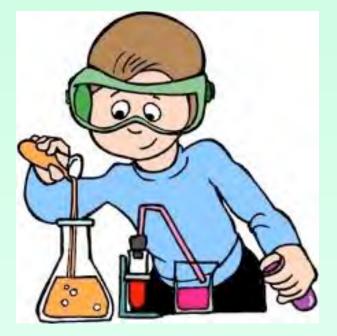
Chemistry (General)

- Physical Chemistry
- Organic Chemistry (other than biochemistry)
- Materials
- Fuels
- Pesticides
- Plastics
- Metallurgy
- Soil Chemistry



Chemistry-Applied

- Measures and comparisons of materials durability
- Flammability
- Effectiveness for intended use
- Product testing for real world applications.



JR Category

ONLY

Earth/Space Science

- Geology
- Phys Oceanography
- Meteorology
- Atmospherics
- Petroleum Geology
- Mineralogy Topography

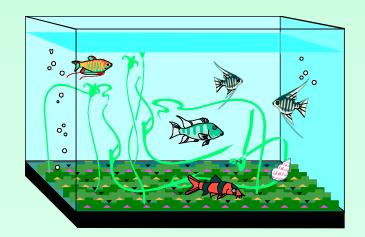
Geography

- Seismology
- Speleology
- Geophysics





- Interaction of abiotic & biotic elements within any environmental investigation
- Pollution sources
- Impact studies
- Resource access
- Environmental alteration



Engineering Applications

 Project in which a potentially useful product is created



Engineering Research

- Engineering analysis
- Tests of efficacy of commercial products
- Comparisons of physical or biomedical properties of commercial products



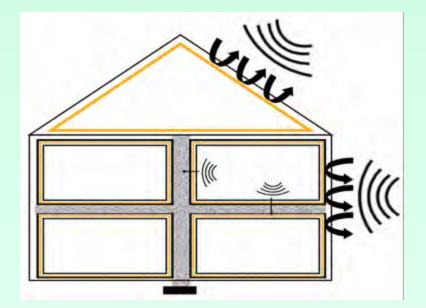
Environmental Management

- Conservation of natural resources and usage modalities
 - Crop rotation
 - Use of renewable energy sources
 - Terrace farming
 - Recycling
- Environmental protections



Materials Science

- Studies of materials characteristics and their static physical properties
 - Thermal, electrical, acoustic, optical, electromagnetic, etc.





Mathematics/Computer Sci

- Abstract Algebra
- Number Theory
- Statistics
- Probability

Calculus

Geometry

Logic



Complex Analysis

Operations Research

Information systems

- New developments in software or hardware
- Computer methodologies & systems organizations
- Data structures, coding, encryption & information theory



Microbiology

- Bacteriology
- Studies of prokaryotes, Protists & Fungi
 - Genetics, growth, reproduction, and responses to chemical & physical stress



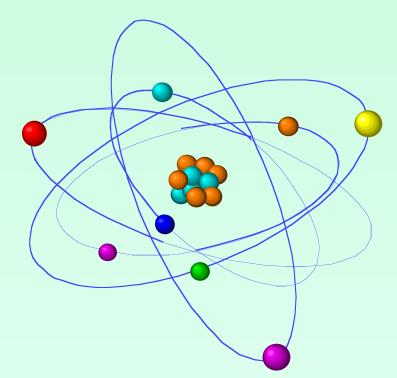


- Effect of any drug or chemical on any living animal or humans
- Studies can be at the cellular or organismal level





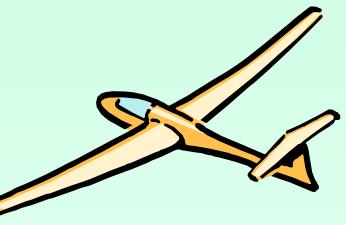
- Experimental or theoretical studies of the physical properties of matter in all forms
 - Computer
 simulations
 of physical
 systems



Physics - Aerodynamics/ Hydrodynamics

- Studies of aerodynamics and propulsion of air, land, water, and space vehicles; aero/ hydrodynamics of structures and natural objects.
- JR Category ONLY

Studies of the basic physics of fluid flow.



Physics -Electricity & Magnetism

 Experimental or theoretical studies with electrical circuits, electro-optics, electromagnetic applications, antennas and propagation, and power production.



Plant Biology

- Agriculture
- Agronomy
- Horticulture
- Forestry
- Plant Taxonomy
- Phycology
- Hydroponics

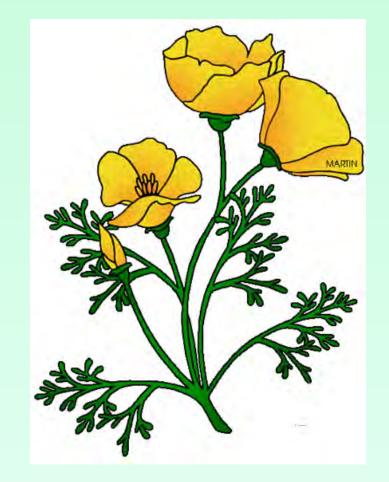
Plant Genetics

Mycology



Plant Physiology

- Studies of the major plant organ system functions involving:
 - Genetics
 - Immunology
 - Pathology
 - Reproduction



Product Science

JR Category

ONLY

 Comparison and testing of natural and man-made products





1. Every LA County Middle School and High school receives a <u>notice</u> for entry to the LA County Science Fair in early September.





2. Site Science Fair Coordinator and and online school registration opens mid Sept to end of January.

Every document will be posted and downloadable at <u>http://www.lascifair.org</u>



Notification

4. The Site Science Fair Coordinators will be notified of approval/rejection of submitted Student Research Plans.

Check website for specific dates



Important Dates for Students

Sept. 15, 2014	School and Site Coordinator Online Registration opens
October 8, 2014	Deadline for Fall submission for proposed Student Research Plan involving tissues/cell lines, human subjects, vertebrate animals, hazardous materials and/or microbes.
October 13-19, 2014	Notification sent to Site Science Fair Coordinator regarding approval/disapproval of Student Fall Research Plans
December 5, 2014	Deadline for Early-Bird School Registration Fee Payment (A 20% discount)
November 14, 2014	Deadline for Winter submission for proposed Student Research Plan involving tissues/cell lines, human subjects, vertebrate animals, hazardous materials and/or microbes.
November 15-21, 2014	Notification sent to Science Fair Coordinator regarding approval/disapproval of Student Winter Research Plans.
December 8, 2014	Final Deadline for re-submission of Revised Student Research Plans involving tissues/cell lines, human subjects, vertebrate animals, hazardous materials and/or microbes.
December 9-12, 2014	Notification sent to Site Science Fair Coordinator regarding approval/disapproval of Student Research Plans.
Jan. 5, 2015	Student Online Registration Opens
January 23, 2015	Deadline for any changes in procedure or protocol for previously-approved projects involving tissues/cell lines, human subjects, vertebrate animals, hazardous materials and/or microbes.
Jan. 30, 2015	School and Site Coordinator Online Registration Closes.
March 4, 2015	Student Online Registration and Volunteer Online Registration Closes.
March 6, 2015	Final Deadline - School registration fee
March 26 - 28, 2015	65th Annual Los Angeles County Science Fair Pasadena Convention Center

Pre-Approval for **Projects** ADDED

Los Angeles County Science Fair Does your project require Pre-Approval? Find out fast!

Some research projects require Pre-Approval from the Science Review Committee (SRC). If you answer YES to any of the questions below, review the General Information Section 1 of Certification Form # 601-068 AND refer to the Rules & Regulations in the section noted below.



Project does NOT need SRC Pre-Approval! YOU MUST SUBMIT: Jr. Division Research Plan <u>with Signatures</u> (Form 601-068) <u>or</u> Sr. Division - ISEF Certification Forms

DEADLINES FOR SUBMISSION TBA

For additional information concerning these Rules & Regulations, Certification Form # 601-068 (Jr. Division only) and ISEF Certification Forms (Sr. Division only), contact: Jennifer Moses, 323-496-6797 or <u>imoses@lascifair.org</u>

New Research Rules & Regulations

- Clearer and more detailed NEW PAGE regulations for project safety and procedures, following current state and ISEF guidelines.
 - Linked to <u>resources</u>
 - Linked to 5 <u>sub-pages</u> targeting projects involving <u>tissues/cell lines</u>, <u>human subjects</u>, <u>vertebrate animals</u>, <u>hazardous materials</u> and/or <u>microbes</u>.
- FAQ pages specifically targeting problem areas for approval





New Online Project Certification Approval

- Only for students with potential projects involving tissues/cell lines, human subjects, vertebrate animals, hazardous materials and/or microbes.
 - Check website for instructions (mid Sept)

Login!

NEW PAGE

COVER SHEET: Certification Forms

Send in ONE per school, submitted ONLINE by the Site ADDED Coordinator

EXAMPLE – Should be the first page of a packet of certification docs COVER SHEET FOR STUDENT CERTIFICATION FORMS

(Jr. Division- Certification Form 601-068 AND Sr. Division- ISEF Certification Forms) List of Possible Site Student Entries for Projects Involving

Tissue/Cell Lines, Human Subjects, Vertebrate Animals or Hazardous Chemicals (Projects that do not involve tissues, human subjects or vertebrate animals are not included on this form)

IMPORTANT: To access Jr. Div. Certification Form 601-068 (NEW!) and ISEF Certification Forms, go to http://www.lascifair.org/site-coordinators/site-coordinators/

School: Smallville Middle School

🛛 Junior Division 🛛 🔲 Senior Division

District: Gotham City USD

Science Fair Site Coordinator's Name: Clark Kent

Email: ckent@gothamusd.org

Work Phone: 777-777-777

Cell Phone:111-111-1111

Individual Projects Student Name (Last, First)	Project Involves Tissue/Cell Lines	Project Involves Human Subjects	Project Involves Vertebrate Animals	Project Involves Hazardous Chemicals
Olsen, Jimmy		X		
Lang, Lana			\boxtimes	
Luther, Lex				X
Baggins, Frodo		×	· · · · · · · · · · · · · · · · · · ·	
Gamgee, Sam		X		
Elendil, Arwen		1	X	
Greenleaf, Galadriel	×	<u> </u>	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
Fa, Mulan			X	<u> </u>
Urura, Nyota		X		
Crusher, Beverly	X		E	
Riker, Will	<u> </u>	×	· · · · · · · · · · · · · · · · · · ·	<u> </u>
Sisko, Benjamin	E		E	
Dax, Jadzia	X	1		
Team Projects Names (Last, First)	Project Involves Tissue/Cell Lines	Project Involves Human Subjects	Project Involves Vertebrate Animals	Project Involves Hazardous Chemicals
Skywalker, Luke; Leya, Princess; D2, R2		M		0
Stark, Tony; Potts, Pepper; Rhodes, Rhodey	Ш	Ð	Ц	
Xavier, Charles; Grey, Jean; Munroe, Ororo	M		Ц	

If there are further entries for consideration, please submit on an additional form.

All Student Certification Form submissions, including this completed form, MUST be electronically saved and submitted as a complete PDF packet (maximum file size should not exceed 40 MG) to the Science Fair email address: certforms@lascifair.org.

> Deadline Dates for Electronic Submittal: (1) June 6, 2013 (Summer Submission); (2) October 4, 2013 (Fall Submission); (3) December 6, 2013 (Winter Submission)

The Los Angeles County Science Fair Science Review Committee (SRC) will no longer accept hard copies or faxed copies of completed student Certification Forms.

Research Plan for Submission

- Objective/Problem/Hypothesis (include evidence of search for alternative to vertebrate animals)
- Materials: (detailed)
- Bibliographic References (a minimum of 3 references, not exclusively Internet):
- Procedure/Research Techniques
 - Provide a <u>clear and detailed description</u>/outline of proposed procedure, *including equipment to be* used, safety measures, and disposal of hazardous chemicals.
- Risk Assessment: detail any possible risks
- 2-3 more pages of information, digitally signed

Certification⁽¹⁾ Forms (Jr. Div.)

Show Jr. Certification Forms PowerPoint Here

Certifications for Experiments with Tissues, Cell Lines and/or Vertebrate Animals

) Certification by Teacher/Advisor

I have read the research plan and agree to sponsor the named student and assume responsibility for compliance with the existing laws, rules and regulations pertaining to tissue samples, cell lines, and/or vertebrate animals.

Type or Print Name	Signature of Teacher/Advisor	Date Signed	
Name of Institution	Position /Title		
Address of Institution		Telephone No.	

(2) Certification by Biomedical Scientist

I certify that I have reviewed and approved the Research Plan; that if the student or Designated Adult Supervisor is not trained in the necessary procedures, I will ensure his/her training. I will assure the requirements of the California Education Code and Los Angeles County Science Fair regulations are fully met; that I will provide advice and supervision personally or through a Designated Adult Supervisor throughout the project; and, that I am a qualified scientist with working knowledge of the techniques to be used by the student in this research.

Type or Print Name	Signature of Biomedical Scientist	Date Signed	
Name of Institution	Position/Title	Earned Degree	
Address of Institution		Telephone No.	

(3) Certification by Person Providing Tissue Samples or Cell Line Samples (Required for Projects Involving Tissue/ Cell Lines)

I certify that the tissue or cell line samples listed in the Research Plan were provided by my institution, without the direct involvement of the student.

Type or Print Name	Signature of Person Certifying Samples	Date Signed	
Name of Institution	Position/Title		
Address of Institution		Telephone No.	

(4) Certification by Animal Care Supervisor (Required for all Vertebrate Animal Projects)

I certify that I have reviewed and approved the Research Plan and will supervise and accept primary responsibility for the quality of care and handling of live vertebrate animals used by the student. I further certify that I have read and understand the rules and regulations of the Los Angeles County Science Fair, as well as the California Education Code.

Type or Print Name	Signature of Animal Care Supervisor	Date Signed	
Name of Institution	Position/Title		
Address of Institution		Telephone No.	

(5) Certification by Designated Adult Supervisor (Required for All Projects)

I certify that I have reviewed and understand the Research Plan and am familiar with the techniques to be used by the student. I will provide direct supervision of the student for the project.

Type or Print Name	Signature of Adult Supervisor	Date Signed
Name of Institution	Position/Title	
Address of Institution		Telephone No.

Sr. Div. Forms (same as Intel ISEF

Show Jr. Certification Forms PowerPoint Here

Research Plan Instructions

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. Goals/Expected Outcomes/Hypotheses

C. Description in detail of method or procedures (The following are important and key items that should be included when formulating ANY AND ALL research plans.)

- Procedures: Detail all procedures and experimental design to be used for data collection
- Risk and Safety: Identify any potential risks and safety precautions to be taken.
- Data Analysis: Describe the procedures you will use to analyze the data/results that answer research questions or hypotheses

D. Bibliography: List at least five (5) major references (e.g. science journal articles, books, internet sites) from your literature review. If you plan to use vertebrate animals, one of these references must be an animal care reference.

- Choose one style and use it consistently to reference the literature used in the research plan
- Guidelines can be found in the Student Handbook

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

1. Human participants research:

- Participants. 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?
- Risk Assessment
 - 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, birth dates, 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?
- Informed 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
- 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
 - Detailed chemical concentrations and drug dosages
- 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:

- 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



Student Online Registration



6. Student <u>online registration</u> in early January at:

http://www.lascifair.org/registration

7. Site Science Fair Coordinators must submit online student verification information and ADHERE TO ALL DEADLINES.

General Fair Schedule Pasadena Convention Center

 Registration & Set Up 2:00pm - 9:00pm Day 1 Judging & Interactive Science: Day 2 9:00am - 5:00pm - ALL students present for interviews - Interactive Science Activities - students Day 2 10:00am- 5:00pm Interactive Science Activities Day 3 10:00am- 5:00pm and Exhibit Hall open to the public Pre-Awards Ceremony Dav 3 6:00pm – 7:00pm Presentation of Awards 7:00pm - 9:00pm Day 3 Students Remove Projects Day 3 5:00pm- 10:00pm Check <u>http://www.lascifair.org</u> for specific dates, locations

and special events.



- Have good directions to the site
- Bring money for parking & food
- Arrive early
- Know where to register





- Bring a book for waiting time
- Bring a camera to snap friends' projects







- Set up quickly
- Relax, view other projects
- Be positive! You've done the very best you could, given the present circumstances.
- Don't miss an interview!









- Students compete for first, second, third and honorable mention place medals
- Special awards and scholarships provided by the business community.

• First, second and third place winners qualify to compete in the *California State Science Fair*.





International Science & Engineering Fair

 Top 2-7 student projects in the Senior Division may be selected <u>for international</u> competition!





Judging











 Clothing: Neat, preferably business style it shows your respect for the judges







 Introduce yourself to each judge, <u>shake</u> their hands

 Courtesy: If able, stand when judges come to your exhibit and remain standing until they leave





What Judges Expect from Students

- *Enthusiasm!* An interview can be fun!
- <u>Pride</u> in your projects and accomplishments
- Give as <u>much</u> information as possible, *BUT*...
- Be able to explain your projects <u>clearly and concisely</u>
- To be able answer questions appropriate to your grade level and age



The Judges Will Want To Know:

- How was your project topic selected?
- Did you receive help and if so, how much?
- What has been previously known about the project's general subject area?
- What would the you <u>do</u> if there were additional time to spend on the project?
- What have you learned through the investigation?
- If this project was continued, what would be the next step(s)?







- Rehearse Your Presentation
 - You will more composed if you are prepared.
- Do your BEST!
 - Be calm, confident and professional.
 - Know what you are talking about and you will do <u>fine!!!</u>



Judging Standards-Science

- Creativity
 - Originality, uniqueness of approach



- Scientific Thought
 - Depth of study and effort in using scientific procedures to solve a clearly defined problem
- Thoroughness
 - Study is complete within the scope of the problem.



Judging Standards-Science

Special skills

 Construction or equipment use; computational and design skills

- Clarity
 - Clearly explained orally and through the display.
 - Project notebook is well organized, neat and accurate.
 - Sources of ideas, data and assistance are clearly identified







Judging Standards-Math

- Math & Computer Creativity
 - Concepts used ingeniously, new viewpoint or interpretation of results
- Analytical Methods
 - Depth of study and effort, clarity, refining
- Presentation
 - Good visuals, clear explanations
- -72315 2 5 5 3

- Background
 - Appropriate literature search, special skills evident, detailed notebook

Judging Standards-Teams

- Team Aspects
 - Why is this a team project?
 - Do all understand objectives & outcome?
 - Unique contributions of team members?
- Good Science Aspects
 - Creativity, scientific thought, thoroughness, skill, clarity
- Research Notebook
- Quantitative Analysis
- Qualitative Analysis



Exhibit Hall Open to the Public Day 2 & 3, 10am- 5 pm



Interactive Science Exhibits

Day 2, 10:00 am – 5:00 pm (general public) Day 3, 10:00 am – 5:00 pm (general public)





Pre-Awards Show Day 3 6:00 – 7:00pm





Awards Ceremony Day 3 7:00- 9:00pm





- ALL students should plan to be present
- 1st, 2nd, 3rd place <u>or</u> Honorable mention in each category
- Special Awards from professional organizations



- or prizes from fair sponsors
- Decision of the judges is FINAL



Junior Sweepstake Winners!



After Public Viewing

- Take down projects promptly
- All projects must be removed by 10:00 pm
- No storage space: uncollected projects go in the trash





Developed by

Anne Maben Science Consultant, UCLA Science Project

Dean Gilbert Former President, LA County Science Fair



© 2014 LA County Science & Engineering Fair

Photography by Anne F. Maben ©2014