



# 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
  - Why does this need to be a *team* project?
  - Every team member should have a unique contribution to the project and be able to justify their participation





# GOALS

- 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



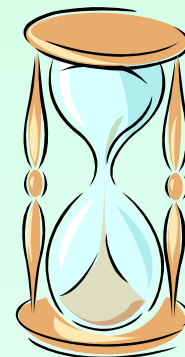


# Sample Timeline

*Get an early start (**September**)*

*Most school fairs are Feb. or March!*

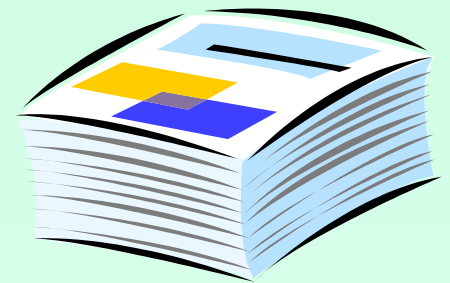
- 1. Decide on a project** **1-2 weeks**
- 2. Background research** **2-3 weeks**
- 3. Hypothesis/project design** **1-2 weeks**
- 4. Submit project proposal to teacher for approval *before* starting experimentation** **1 week**





# Sample Timeline

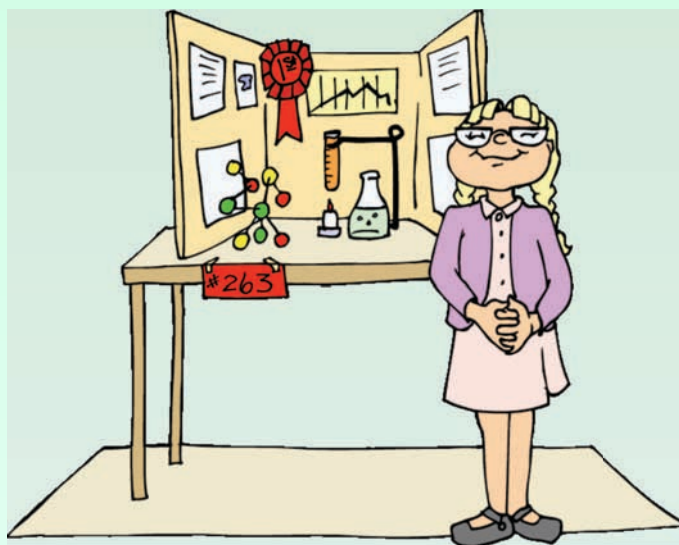
- 5. Completing the appropriate Jr. or Sr. Certification Forms to the teacher for approval before starting experimentation:**
- *Certification Of Humane Treatment Of Live Vertebrate Animals*
  - *Certification Of Compliance Of Research Involving Humans*
  - *Certification Of Hazards Control*
  - *Certification of Tissue/Cell Lines Source*





# Sample Timeline

- |                                      |                   |
|--------------------------------------|-------------------|
| <b>6. Experimentation</b>            | <b>4- 8 weeks</b> |
| <b>7. Results, analysis</b>          | <b>1- 2 weeks</b> |
| <b>8. Writing the project report</b> | <b>1- 2 weeks</b> |
| <b>9. Building a display board</b>   | <b>1 week</b>     |





# Regulations

- Students entries from grades **6 -12** only
- Research design based on scientific methodology
- IF the project involves **tissues, human subjects or vertebrate animals**, proper paperwork must be submitted and pre-approved by the LA Science Fair **BEFORE** beginning the research itself.







# Regulations

- **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





# Regulations

- **Display fits** within the prescribed space
- Uses a **title** descriptive of your study
  - Subtitles may be used for clarification
- **NO live animals or plants**
- **NO tissues or microorganisms** on display  
*(use pictures or a model instead...)*
- **NO photos** which show procedures **hurtful to vertebrate animals.**





# 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 at your own risk.
- Give attention to **safety**

***Decision of the Science Fair  
Committee is final***

# Fair 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**
  - **Immunology**
  - **Neurobiology**
  - **Pathology**
  - **Reproduction**
  - **Sensory biology**



# Behavioral/ Social Sci - Human

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

**JR Category  
ONLY**

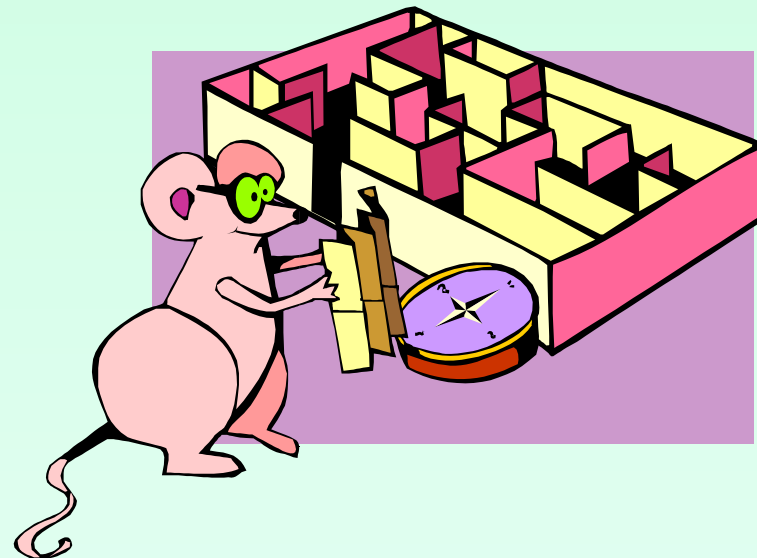


# Behavioral/ Social Sci – Non-human

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

JR Category  
ONLY

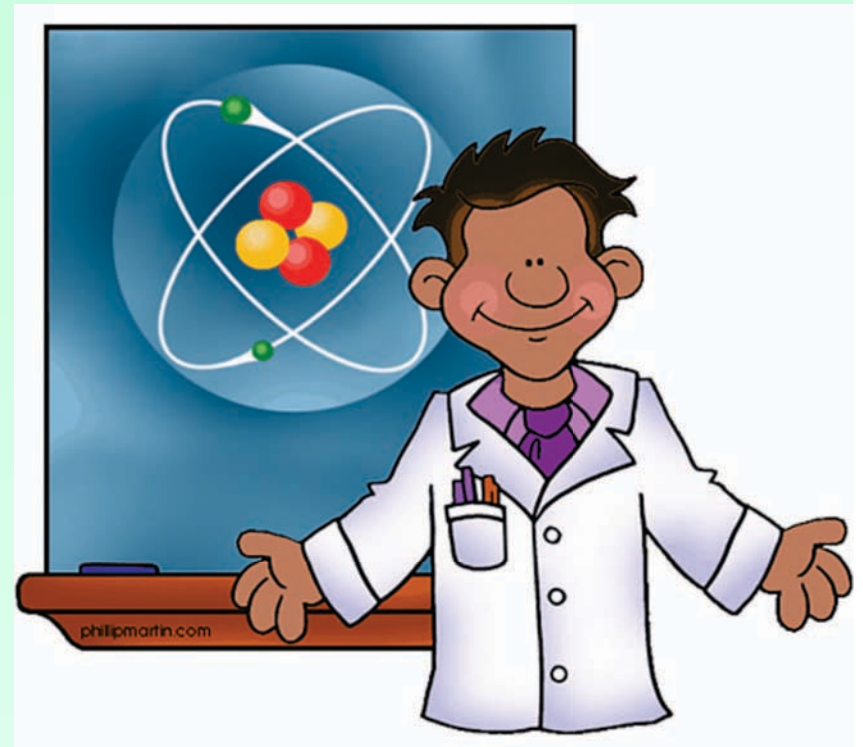
- Educational Testing
- Reading Problems





# 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**

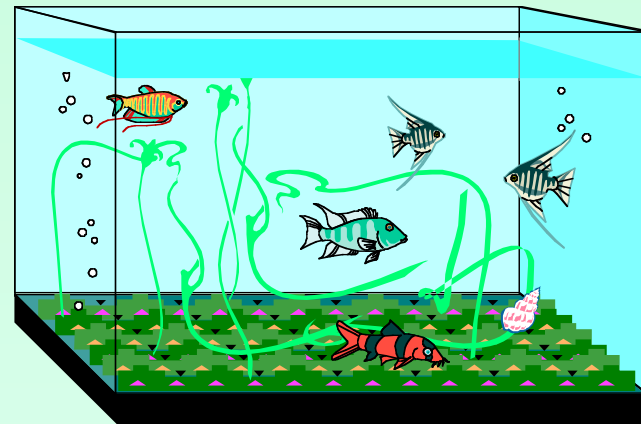
**Speleology**

**Geophysics**



# Ecology

- **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**

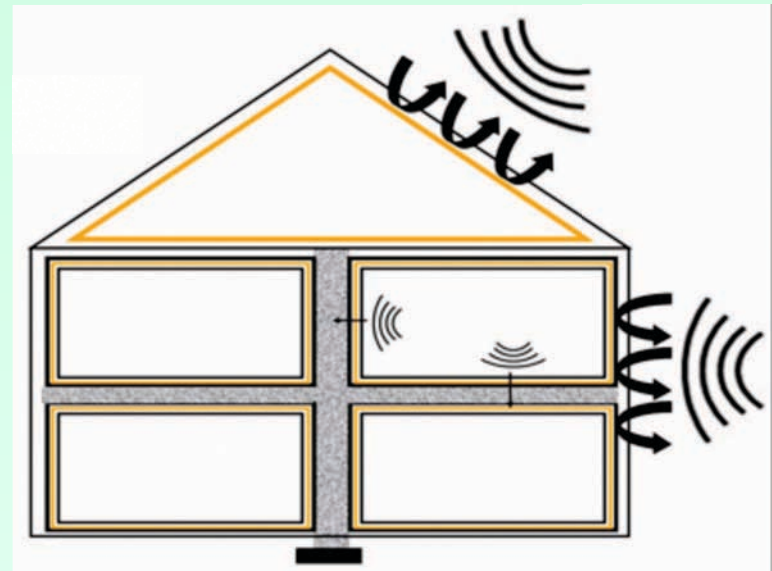




# Materials Science

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

JR Category  
ONLY



# Mathematics/Computer Sci

- Abstract Algebra
  - Number Theory
  - Statistics
  - Probability
  - Operations Research
  - New developments in software or hardware
  - Computer methodologies & systems organizations
  - Data structures, coding, encryption & information theory
- Calculus
  - Geometry
  - Logic
  - Complex Analysis
  - Information systems



# Microbiology

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



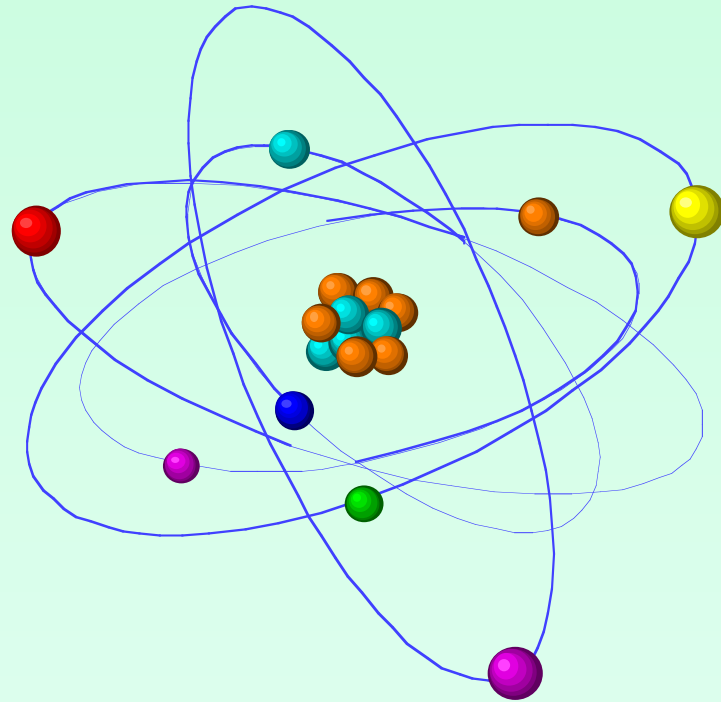
# Pharmacology

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



# Physics - General

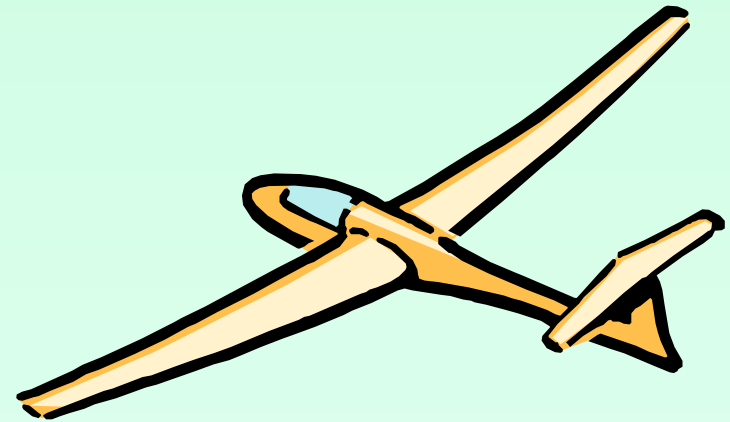
- **Experimental or theoretical studies of the physical properties of matter in all forms**
  - **Computer simulations of physical systems**



# Physics - Aerodynamics/ Hydrodynamics

- **Studies of aerodynamics and propulsion of air, land, water, and space vehicles; aero/hydrodynamics of structures and natural objects.**
- **Studies of the basic physics of fluid flow.**

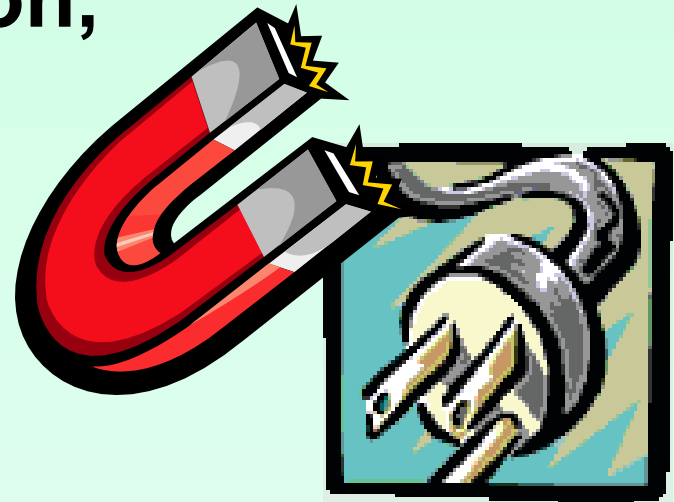
**JR Category  
ONLY**



# Physics - Electricity & Magnetism

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

**JR Category  
ONLY**



# 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

- **Comparison and testing of natural and man-made products**

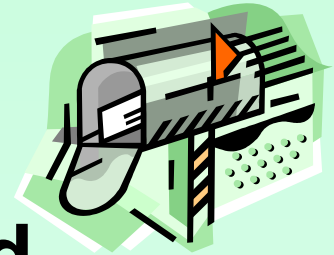
**JR Category  
ONLY**





# School Registration

**1. Every LA County Middle School and High school receives a notice for entry to the LA County Science Fair in **mid September.****



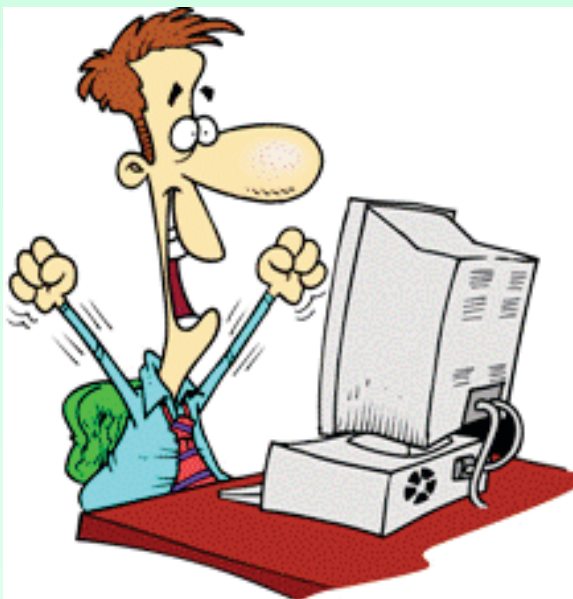
**2. Site Science Fair Coordinator and **and online school registration** opens end of Sept to end of January.**

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



# Notification

- 4. The Site Science Fair Coordinators will be notified of approval/rejection of submitted Student Research Plans.**
  - Check website for **specific dates**





# Student Online Registration



**6. Student online registration opens 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

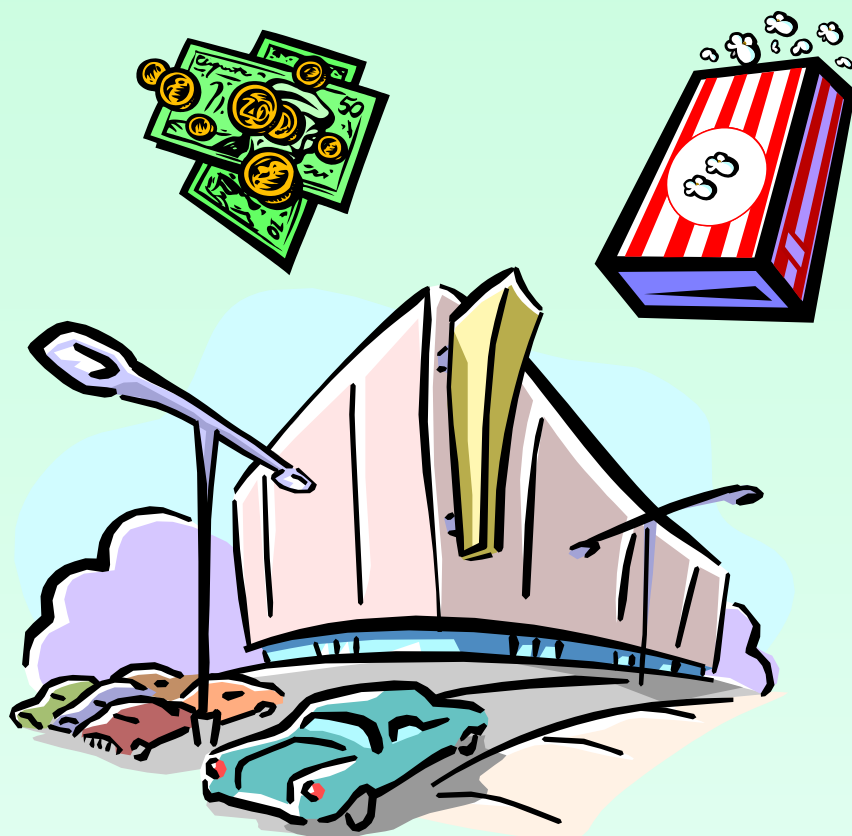
- **Registration & Set Up** Day 1 2:00pm - 9:00pm
- **Judging & Interactive Science:** Day 2 9:00am - 5:00pm
  - *ALL students present for interviews*
  - **Interactive Science Activities – students** Day 2 10:00am- 5:00pm
- **Interactive Science Activities and Exhibit Hall open to the public** Day 3 10:00am- 5:00pm
- **Pre-Awards Ceremony** Day 3 6:00pm – 7:00pm
- **Presentation of Awards** Day 3 7:00pm - 9:00pm
- **Students Remove Projects** Day 3 5:00pm- 10:00pm

Check <http://www.lascifair.org> for specific dates, locations and special events.



# The Day of the Fair

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





# The Day of the Fair

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







# The Day of the Fair

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





# Awards



- 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 2-6 student projects in the Senior Division may be selected for international competition!



Courtesy of the Intel ISEF

# Judging





# Judging

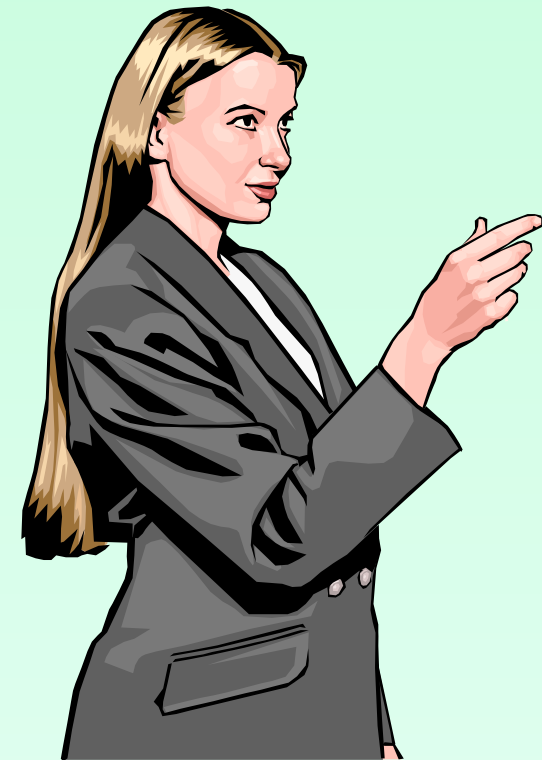
- **Clothing:** Neat, preferably business style—it shows your respect for the judges





# Judging

- **Introduce** yourself to each judge, shake their hands
- **Courtesy**: If able, stand when judges come to your exhibit and remain standing until they leave





# Judging





# Judging

- **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 do *fine!!!*



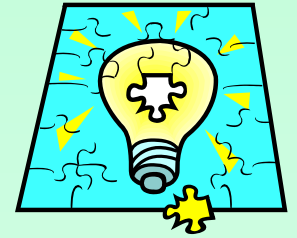




# Judging Standards-Science

- **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

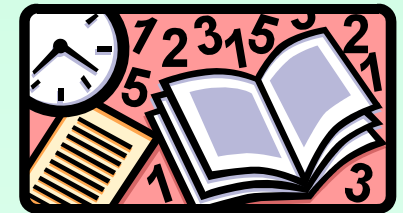
- **Special skills**
  - Construction or equipment use; computational and design skills
- **Clarity**
  - Clearly explained orally and through the display.
  - Project notebook is well organized, neat and accurate.
  - Sources of ideas, data and assistance are clearly identified





# 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
- **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



# Makers Fair

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

Day 3, 10am-5pm (general public)





# Pre-Awards Show

Day 3 6:00 – 7:00pm





# Awards Ceremony

Day 3 7:00- 9:00pm

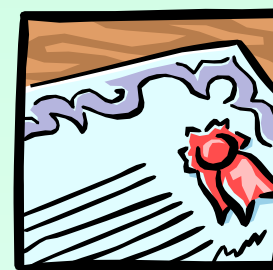






# Awards Ceremony

- **ALL students should plan to be present**
- *1st, 2nd, 3rd place or 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**

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***Dean Gilbert***

***President, LA County Science Fair***



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