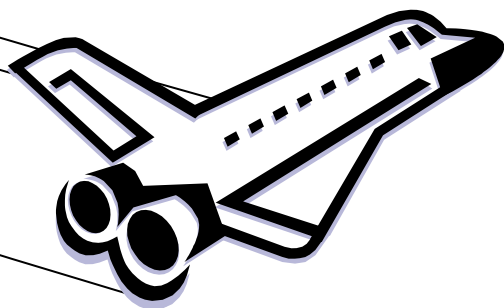


**SECONDARY  
SCIENCE FAIR**

**STUDENT  
APPENDICES**





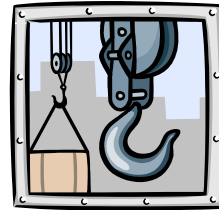
# SCIENCE TOPICS FOR GRADES 6-12

Try to choose a science project that lines up with a science topic covered during your current school year. Or, you might choose to do a science project from next year's topics. Use the list of topics below to help you think of project ideas if you are not sure how to start.

	<b>Earth Sciences</b>	<b>Life Sciences</b>	<b>Physical Sciences</b>
<b>6<sup>th</sup></b>	<ul style="list-style-type: none"> <li>▪ Earth's Layers</li> <li>▪ Plate Tectonics</li> <li>▪ Mountain Building</li> <li>▪ Earthquakes, Faults, and Epicenters</li> <li>▪ California Geology</li> <li>▪ Mechanical &amp; Chemical Weathering</li> <li>▪ Minerals</li> <li>▪ Rock Cycle (Igneous, Metamorphic, and Sedimentary)</li> <li>▪ Sun's Effect on Weather</li> <li>▪ Convections</li> <li>▪ Solar Energy</li> <li>▪ Atmospheric Conditions</li> <li>▪ Natural Resources</li> <li>▪ Stratigraphy: Fossil Locations Rock</li> <li>▪ Geologic Timeline of Earth's History</li> <li>▪ Formation of Fossils</li> <li>▪ Methods of Dating Earth's History</li> </ul>	<ul style="list-style-type: none"> <li>▪ Food Chains / Food Webs</li> <li>▪ Ecosystems</li> <li>▪ Human Impacts on Ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>▪ Density (Qualitative)</li> <li>▪ Energy</li> <li>▪ Temperature vs. Heat</li> <li>▪ Heat Transfer</li> </ul>
<b>7<sup>th</sup></b>		<ul style="list-style-type: none"> <li>▪ Cell Similarities &amp; Differentiation</li> <li>▪ Function of Cell Structures</li> <li>▪ Energy at the Cellular Level</li> <li>▪ Photosynthesis / Respiration</li> <li>▪ Mitosis</li> <li>▪ Genetics</li> <li>▪ DNA – RNA – Protein</li> <li>▪ Sexual / Asexual Reproduction</li> <li>▪ Meiosis</li> <li>▪ DNA, Genes, &amp; Alleles</li> <li>▪ Dominant &amp; Recessive Traits</li> <li>▪ Theory of Evolution</li> <li>▪ Natural Selection</li> <li>▪ Body Systems</li> <li>▪ Taxonomic Keys</li> <li>▪ Kingdoms &amp; Major Phyla</li> </ul>	
<b>8<sup>th</sup></b>	<ul style="list-style-type: none"> <li>▪ Galaxies and Stars</li> <li>▪ Life Cycles of Stars (Nebular Theory, Novas, etc.)</li> <li>▪ Distances in Astronomy</li> <li>▪ Light Sources and Reflectors in the Universe</li> <li>▪ Cosmology (Universe Origin)</li> <li>▪ Solar System</li> </ul>	<ul style="list-style-type: none"> <li>▪ Simple Machines and the Human Body</li> <li>▪ Blood Pressure and Heart Valves</li> <li>▪ Organic Chem. / Biochem.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observing and Defining Motion</li> <li>▪ Forces and their Effects</li> <li>▪ Gravity's Large Scale Effects</li> <li>▪ Basic Atomic Theory</li> <li>▪ Metals, Non-metals, Inert Gases</li> <li>▪ Electrons beyond the Bohr Model</li> <li>▪ Ions and Isotopes</li> <li>▪ Physical &amp; Chemical Properties</li> <li>▪ Element vs. Compound Properties</li> <li>▪ Chemical Bonding</li> <li>▪ Atoms and Ions Forming Solids</li> <li>▪ Chemical Equations &amp; Conservation of Matter</li> <li>▪ Exothermic vs. Endothermic</li> <li>▪ Acids, Bases, and pH</li> <li>▪ Density &amp; Buoyancy</li> <li>▪ Sound and Light Energy</li> </ul>
<b>9<sup>th</sup> through 12<sup>th</sup></b>	<ul style="list-style-type: none"> <li>▪ Earth's Place in the Universe</li> <li>▪ Dynamic Earth Processes</li> <li>▪ Energy in the Earth System</li> <li>▪ Biogeochemical Cycles</li> <li>▪ Structure and Composition of the Atmosphere</li> <li>▪ California Geology</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cell Biology</li> <li>▪ Genetics</li> <li>▪ Ecology</li> <li>▪ Evolution</li> <li>▪ Physiology</li> </ul>	<ul style="list-style-type: none"> <li>▪ Motion and Forces</li> <li>▪ Conservation of Energy</li> <li>▪ Heat and Thermodynamics</li> <li>▪ Waves</li> <li>▪ Electromagnetic and Magnetic Phenomena</li> <li>▪ Atomic and Molecular Structure</li> <li>▪ Chemical Bonds</li> <li>▪ Gases</li> <li>▪ Acids and Bases</li> <li>▪ Chemical Thermodynamics</li> <li>▪ Organic and Biochemistry</li> </ul>

# ***SECONDARY SCIENCE FAIR***

## ***SCIENCE PROJECT TOPIC IDEAS***



**BEHAVIORAL AND SOCIAL SCIENCE** - Psychology, sociology, anthropology, archaeology, ethnology, linguistics, animal behavior, learning, perception, urban problems, reading problems, public opinion surveys, educational testing, and consumer sciences.

**BOTANY** - Agriculture, agronomy, horticulture, forestry, plant taxonomy, plant genetics, hydroponics, phycology, mycology, plant ecology, and plant physiology.

**CHEMISTRY** - Physical chemistry, organic chemistry (other than biochemistry), inorganic chemistry, materials, plastics, fuels, pesticides, metallurgy, and soil chemistry.

**EARTH AND SPACE SCIENCES** - Geology, geophysics, physical oceanography, meteorology, atmospheric physics, seismology, petroleum geology, geography, seismology, speleology, mineralogy, topography, optical astronomy, radio astronomy, and astrophysics.

**ENERGY AND ENVIRONMENTAL SCIENCE** - Energy and energy conservation, and various parameters of the environment.

**ENGINEERING** - Civil, mechanical, aeronautical, chemical, electrical, photographic, sound, automotive, marine, heating and refrigerating, transportation, environmental engineering, etc.; power transmission and generation, electronics, communications, architecture, bioengineering, lasers, computers, and instrumentation.

**MATHEMATICS AND COMPUTERS** - Calculus, geometry, abstract algebra, number theory, statistics, complex analysis, probability, logic, operations research, and other topics in pure and applied mathematics, computer programs and language.

**MEDICINE AND HEALTH** - Medicine, dentistry, pharmacology, veterinary medicine, pathology, ophthalmology, nutrition, sanitation, pediatrics, dermatology, allergies, speech and hearing, and consumer science.

**PHYSICS** - Solid state, optics, acoustics, particle, nuclear, atomic plasma, super-conductivity, fluid and gas dynamics, thermodynamics, semiconductors, magnetism, quantum mechanics, and biophysics.

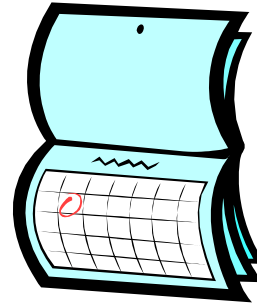
**ZOOLOGY** - Animal genetics, ornithology, ichthyology, herpetology, entomology, animal ecology, anatomy, paleontology, cellular physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate, neurophysiology, and studies of invertebrates.



# ***STUDENT TIMELINE***

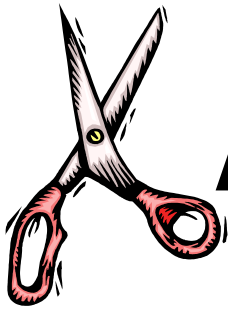
***for***

## ***SCIENCE FAIR PROJECT***



<b>TASK</b>	<b>Teacher's Date Due</b>	<b>Teacher's Initials</b>	<b>Parent's Initials</b>
1. Choose, and submit for teacher approval, a topic question/problem to investigate			
2. Do preliminary research. Collect and read books and other resources for your topic.			
3. Develop a hypothesis (your best guess) based on your preliminary research.			
4. Decide on the procedure that you will use to test your hypothesis.			
5. Make a list of your materials. Gather your materials.			
6. Conduct your experiment or scientific survey, build and test your invention or Rube Goldberg Device, or shadow your science career mentor. Record data.			
7. Organize your data and results.			
8. Write your conclusion based on your results. Write a "real world" application of what you learned.			
9. Write a draft of your science fair report.			
10. Proofread your draft or have someone else proofread it. Type or write a final copy of your report.			
11. Plan the layout of your display board. Be sure you include all the mandatory subtitles for <u>your project type</u> . Assemble your science fair display board and display items.			
12. Turn in your science fair project (report, display board and display items).			
13. Take your science fair project home.			

**EXAMPLE  
of a Timeline  
Sheet your  
teacher may  
give you**



# SCIENCE FAIR

## *MATERIALS SOURCES*



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### **Alin Party Company**

4139 Woodruff Ave., Lakewood  
(562) 420-2489

### **CM School Supplies**

5440 E. Del Amo, Long Beach  
(562) 429-2425

### **Home Depot**

2450 Cherry Ave., Signal Hill  
(562) 595-9200  
751 Spring St., Signal Hill  
(562) 426-4667  
5000 Hardwick St., Lakewood  
(562) 529-3500  
[www.homedepot.com](http://www.homedepot.com)

### **Lowe's**

7300 E. Carson St., Long Beach  
(562) 421-9996  
2840 Bellflower Blvd., Long Beach  
(562) 496-8120  
[www.lowes.com](http://www.lowes.com)

### **Lyon's Art Supply**

420 E. 4th Street  
Long Beach, CA  
(562) 435-5383

### **Michael's Crafts**

4000 Hardwick St., Lakewood  
(562) 633-1913  
7320 Carson St., Long Beach  
(562) 377-0669

### **Office Depot**

2301 E. Willow, Signal Hill  
(562) 427-6333

### **Radio Shack**

For a location near you, call  
(800) 843-7422

### **Staples**

3515 Atlantic Avenue, Long Beach  
(562) 427-6477  
4600 Pacific Coast Highway, LB  
(562) 597-1922  
7400 E. Carson St., Long Beach  
(562) 377-0403  
[www.staples.com](http://www.staples.com)  
1-800-378-3-2753



# COMMUNITY RESOURCES

## Airports

If your project deals with aeronautics, then an airport would be a good place to locate information. Airports often employ meteorologists who may help you with a project dealing with weather.

## Animal Hospitals and Wildlife Rescue Centers

Often veterinarians are willing to help students with science projects. If you need an appointment, call about a week in advance.

## Botanical Gardens and Commercial Nurseries

Plant specialists can be found at local botanical gardens and nurseries. Sometimes they will donate materials if you explain your project to them.

## Colleges and Universities

Local college and university libraries offer you a wider selection of references than your local library. Scientists on the faculty may help you and even allow you to use their laboratory facilities.

## Government Agencies

Look in your telephone book for government agencies. Agencies are listed under Federal, State, and Municipal categories. The California Department of Fish and Game in Long Beach is a good source.

## GPO

Send a letter to the address below indicating what topic area you are interested in and they will send you a catalog of available books and pamphlets.

U.S. Government Printing Office  
Superintendent of Documents  
Washington, D.C. 20402

## Hospitals and Medical and Dental Offices

Many hospitals have an education department that you can contact. They also have libraries with up-to-date information. Perhaps your family physician or dentist can give you some assistance.

## Industries

Major industries have specialists that may be willing to help. Locate them with your telephone book or magazine advertisements. When writing to corporations, include "Public Relations Department," in the address on the envelope and in the letter.

## Nature Centers, Parks, and Marine Reserves

Naturalists work at nature centers. They will be able to give you information if your project involves natural environments and ecosystems.

## Telephone Books

The Yellow Pages of your telephone book, especially a commercial telephone directory, will give you names, addresses, and general product information. When calling anyone, remember to be polite. Give your name and tell exactly why you are calling.

## Zoos and Aquariums

The L.A. and San Diego zoos, Sea World, the Cabrillo Marine Aquarium in San Pedro, and the Long Beach Aquarium of the Pacific have education departments that are often willing to help. They may be able to arrange a meeting for you with an animal keeper or zoologist.



# INTERNET REFERENCES

## Internet use and web sites:

- You may get ideas and material from the internet.
- You are not allowed to copy a science project from the internet. You must modify it to contain both a control and a variable
- Parents must oversee the web sites that their child visits; many have pop-ups and links that are not for elementary school age students.
- Using information from the web is just like a book, word for word is plagiarism and you need to include it in your bibliography.
- To use copyright protected pictures and text from a web site; you must get permission from the author. This usually takes a long time.
- Include a print out of permission (email is OK) in the bibliography.
- Refer to the Web Site list in this handout.



## WARNING!

- Anyone can create a Web site; this does not mean its information is correct!
- Make sure the web site is run by a large, recognized group such as a college or organization.
- DOT “org” or “edu” are generally trustworthy for accuracy of content.

## Web site samples that can be used for research:

Description	URL
Internet Public Library	<a href="http://www.ipl.org">http://www.ipl.org</a>
Within the library, Kid friendly	<a href="http://www.ipl.org/div/kidspace/projectguide/">http://www.ipl.org/div/kidspace/projectguide/</a>
National Oceanic & Atmosphere Administration	<a href="http://www.noaa.gov/">http://www.noaa.gov/</a>
Weather and ocean related phenomena	<a href="http://www.education.noaa.gov/">http://www.education.noaa.gov/</a>
US Government web site for kids	<a href="http://www.kids.gov/">http://www.kids.gov/</a>
US Geological Survey (USGS)	<a href="http://www.usgs.gov/">http://www.usgs.gov/</a>
Earthquake section of USGS	<a href="http://earthquake.usgs.gov/4kids/">http://earthquake.usgs.gov/4kids/</a>
Geology section of USGS	<a href="http://geology.usgs.gov/index.shtml">http://geology.usgs.gov/index.shtml</a>
Fish and Wildlife (Department of the Interior)	<a href="http://www.fws.gov/">http://www.fws.gov/</a>
Discovery Channel Science Fair	<a href="http://school.discovery.com/sciencefaircentral/">http://school.discovery.com/sciencefaircentral/</a>
Jet Propulsion Laboratory	<a href="http://jpl.nasa.gov/kids/">http://jpl.nasa.gov/kids/</a>
How Stuff Works	<a href="http://www.howstuffworks.com">http://www.howstuffworks.com</a>
Science page of How Stuff Works	<a href="http://www.science.howstuffworks.com">http://www.science.howstuffworks.com</a>

# ***LIBRARY REFERENCES***

## **150 PSYCHOLOGY & SOCIAL SCIENCES**

### **510 MATHEMATICS**

Number System  
Arithmetic  
Geometry

### **520 ASTRONOMY**

Universe  
Solar System  
Moon  
Planets  
Meteors  
Black Hole  
Comets  
Sun  
Constellations  
Telescope  
Map Making

### **530 PHYSICS**

Mechanics  
Matter  
Gravity  
Simple Machines  
Energy and Force  
Solar  
Coal  
Gas  
Nuclear  
Sound  
Light  
Optics  
Color  
Prisms  
Heat  
Electricity  
Magnetism  
Atomic Energy and Force

### **540 CHEMISTRY AND ALLIED SCIENCE**

Crystallography  
Mineralogy



**550 SCIENCES OF EARTH AND OTHER WORLDS**

- Geology (Earth Science)
- Structure of the Earth
- Volcanoes
- Geysers
- Floods (Erosions)
- Caves
- Earthquakes
- Oceanography
- Meteorology
- Climatology and Weather
- Economic Geology
- Metals and Iron
- Water
- Gems

**560 PALEONTOLOGY (Prehistoric Life)**

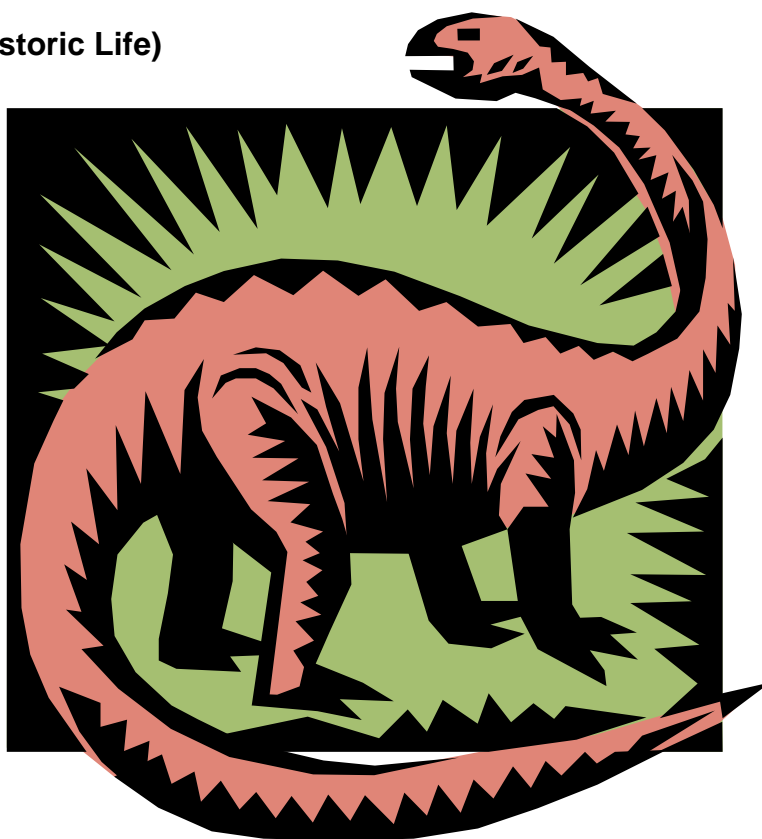
- Fossils
- Dinosaurs
- Prehistoric Caves
- Cave Men
- Cave Art

**570 LIFE SCIENCES**

- Human Races
- Anthropology
- Primitive Societies
- Physical Anthropology
- Primitive Man
- Heredity
- Prehistoric Man
- Biology
- Evolution
- Microbes (Viruses)
- Microscopes

**580 BOTANY**

- Propagation
- Seeds, Flowers, Bulbs
- Types of Plants
- Wild Flowers
- Trees
- Vegetables
- Vines



# LOS ANGELES COUNTY & CALIFORNIA STATE SCIENCE FAIRS

The **Los Angeles County Science Fair** is held annually in the Los Angeles Convention Center in mid-April and is always an exciting and educational experience. Any school wishing to participate must **pre-register by the prior December** through the L.A. County Office of Education. The top



three projects in each category at the county science fair are invited to participate in the **California State Science Fair**, which is generally held during the third week in May. An average of six hundred projects in both the Junior (7th–9th grades) and Senior (10th–12th grades) divisions are on display at each fair. The categories chosen for the LBUSD Science Fair are identical to the categories selected for the county and state fairs. The creativity, dedication, and novel experimentation displayed are astounding. Teachers planning their first science fair would benefit from visiting the county science fair.

The Los Angeles County and California State Science Fairs display and judge the best projects produced by individual schools in the area. Projects developed under the guidance of a single teacher may be entered **directly** into the county science fair, even if their school has no formal science fair and regardless of whether they chose to enter the LBUSD science fair. A maximum of thirteen individual displays and one team display (consisting of two to four members) **per school** are allowed to participate each year.

For details, schedules, judging worksheets and much more, visit their official websites:

**Los Angeles County Science Fair**  
[www.lacoe.edu/sciencefair](http://www.lacoe.edu/sciencefair)

**California State Science Fair**  
[www.usc.edu/CSSF/](http://www.usc.edu/CSSF/)