

Hickory Elementary School

Science Fair 2010

The Hickory Science Fair will be held on Thursday, March 25, 2010 in the cafeteria from 6:00 p.m. – 7:30 p.m. The purpose of the Science Fair is to encourage 1st, 2nd, 3rd, 4th, and 5th grade students (Kindergarten is also welcomed) to develop a greater interest in science and technology and to develop skills in critical thinking, research, problem solving, and use of the scientific method.

While teachers will be available to advise students, the initiative and responsibility belongs to the students.

- Parents may assist their children with their projects.
- Parent participation should be limited to that which assists the child's mastery of the concepts of his/her project and should encourage their child to work on their project as much as they can on their own.
- Each student must be able to demonstrate and explain what he/she has done.

In order to participate, a science fair entry form needs to be turned in to your teacher and approved prior to starting the project. Applications are available on Hickory's website www.hickoryelementary.com/sciencefair2010.pdf, the school office, or Room 14.

Please contact Mrs. Benedetti if you have any questions.

email: fbenedetti@etusd.org

phone: (310) 533-4672 x3114

Science Fair Timeline

Dec. 1 – Jan. 7	Choose a project to do.
January 8	Applications are due for project.
Jan. 11 - Mar. 17	Work on project.
March 18 – 24	Bring project to school to present to class.
March 25	Science Fair open to the public 6:00 p.m. – 7:30 p.m.
March 26	Take project home.
March 29	Science Fair winners announced at flag assembly.
April 1	Winners go to District Science Fair.

PROJECT CATEGORIES

Physical science	Includes light, sound, electricity, magnetism, mechanical energy, physics, chemistry, rocketry, atomic and nuclear energy, heat and force
Earth science	Includes weather and climate, geology, astronomy, space, oceanography, meteorology
Biological science	Includes plant life, animal life, animal behavior, botany, zoology, biochemistry, genetics, physiology, health and safety, pharmacology
Environmental Science	Includes water, air land use, urban problems, ecology, conservation management, pollution, pesticides

Hickory Elementary School

Science Fair 2010

SCIENCE PROJECT REQUIREMENT

1. Choose a project that falls into one of the categories on the Project Categories list. Once your project has been chosen, have it approved by your teacher prior to starting the project.

- You must use the scientific method when doing your science fair project- using the format to the right” Scientific Method Worksheet.”
- Experiments involving animals or human subjects must follow the Los Angeles County Science and Engineering Regulations on the back.
- Use of any of the following as part of your display is PROHIBITED: blood, tissue samples, dangerous, toxic or flammable substances, open flames, bacterial/viral cultures, molds, poisonous plants or animals, dead animals or animal parts, consumable alcohol, tobacco, drugs or medications, hypodermic syringes, sharp items such as knives or razors, open containers of any liquid, electrical hazards, wet cell auto-type batteries, electrical equipment operating on more than 12 volts.
- Projects requiring an electrical outlet as part of their display have to be approved by the Science Fair coordinator prior to starting the project.

2. **Grades 1-3:** Include a summary page with your science fair project - it must show evidence of the use of the scientific method.

Grade 4: Demonstration or experiment

Grade 5: Experiment only

Grades 4-5: Include a written report with your science fair project - put it in a 3-prong report folder. The report must include the following:

- title page
- table of contents
- written report, including research information and evidence of the use of the scientific method
- graphs, charts, illustrations, photographs
- bibliography

3. Plan your display:

- adhere to space requirements-maximum of 36” wide and 18” in depth
- it must have a title and show evidence of the use of the scientific method
- do not display anything that you cannot afford to lose

4. Judging will be done by Hickory teachers.

SCIENTIFIC METHOD WORKSHEET

A. Question: (What do I want to find out?)

B. Hypothesis: (What do I think will happen?)

C. Materials and Equipment needed:

D. Procedure: (What am I going to do?)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

E. Results: (What happened?)

F. Conclusion: (What I found out or learned by doing this project?)

**Los Angeles County Science & Engineering Fair
Regulations for Experiments with Animals and Human Subjects
California Education Code Requirements for Experiments with Animals**

Any student research involving animals must comply with the requirements of the *State of California Education Code Title 2, Division 2, Part 28, Chapter 4, Article 5, 51540*:

In the public elementary and high school sponsored activities and classes held elsewhere than on school premises, live Vertebrate animals shall not, as part of a scientific experiment or any purpose whatever:

- (a) Be experimentally medicated or drugged in manner to cause painful reactions or induce painful or lethal pathological conditions.
- (b) Be injured through any other treatments, including but not limited to, anesthetization or electric shock.

Live animals on the premises of a public elementary or high school shall be housed and cared for in a humane and safe manner. The provisions of this section are not intended to prohibit or constrain vocational instructions in the normal practices of animals husbandry.

International Science Fair Regulations for Experiments with Animals

In addition to the applicable Education Code sections, all student research projects involving animals must comply with the following International Science Fair regulations as modified by the Los Angeles County Science Fair Executive Committee:

1. The basic aims of experiments involving animals are to achieve an understanding of life processes and to further knowledge. They do not include the development of new or refinement of existing surgical techniques or experiments in toxicological studies. Experiments involving animals (live or preserved, vertebrate or invertebrate, excluding *Homo Sapiens*), vertebrate embryos and fetuses and embryos of fowl within three days of hatching, must have defined objectives requiring the use of animals to demonstrate a biological principle or answer scientific propositions. Such experiments *must* be conducted with a respect for life and an appreciation of humane considerations.
2. The use of protista and other invertebrates is to be encouraged for most research involving animals. Their wide variety and the feasibility of using larger numbers than is usually possible with vertebrates makes them especially suitable.
3. To provide for humane treatment of animals, and animal care supervisor knowledgeable in the proper care and handling of experimental animals must assume primary responsibility for the conditions under which the animals are maintained. If the school faculty includes no one with adequate training in this area, the services of a qualified consultant must be obtained.
4. All live preserved animals or animal parts must be lawfully acquired from an approved source, and their care and use must be in compliance with local, state, and Federal laws.
5. The comfort of the animals shall be a prime concern. No research using live vertebrate animals shall be attempted unless the animals are obtained from a reliable source and the following conditions can be assured: appropriate, comfortable quarters; adequate food and water; humane treatment and gentle handling. Care must be provided at all times, including weekends and vacation periods.
6. No experiment involving anesthetics, drugs, thermal procedures, physical stress, organisms pathogenic to humans or other vertebrates, ionizing radiation, carcinogens, or surgical procedures, may be undertaken except under the direct supervision of an experienced and qualified biomedical scientist or designated adult supervisor.

Experiments involving any procedures listed in paragraph 6 which are not in violation of the “painful reaction” or “injured” restrictions of the California Education Code are permitted if certified by a qualified biochemical scientist *prior to the beginning of the investigation*.

It is permissible for the student and designated adult supervisor to consult with a biomedical scientist to obtain detailed instructions and guidance in the techniques to be used by the student under the direct continuous supervision of the designated adult supervisor (for research not conducted in the biomedical scientist’s laboratory). In this instance the designated adult supervisor will be required to certify in writing jointly with the biomedical scientist.

Either the biomedical scientist or adult supervisor must provide continuing supervision to assure compliance with the protocol. Major deviations from the approved protocol may be implemented only with written approval of the biomedical scientist.

The biomedical scientist or adult supervisor must be in the same locality as the student for duration of the experimental work except for short trips. This means that a project started in one city may be continued in another unless an alternate designated adult supervisor, approved by the biomedical scientist prior to the continuation of the experimental work, agrees to supervise the project.

**Los Angeles County Science & Engineering Fair
Regulations for Experiments with Animals and Human Subjects
California Education Code Requirements for Experiments with Animals**

A biomedical scientist is defined as one who possesses an earned doctoral degree in science or medicine and who has current working knowledge of the techniques to be used in the research under consideration. A designated adult supervisor is defined as an individual who has properly trained in the techniques and procedures to be used in the investigation. The biomedical scientist must certify that the designated adult supervisor has been so trained.

Students planning research involving live vertebrate animals or animal parts must, *before* acquiring them for experimentation (in the case of pets or livestock, *before* starting experiments):

1. Become familiar with the laws and regulations relating to experiments involving live vertebrate animals.
2. Obtain a Certification of Humane Treatment of Live Vertebrate Animals form (Form No. 601-066) From the school project advisor, complete the “Research Plan” section and return it to the advisor for review and signature.
3. Bring the Certification of Humane Treatment of Live Vertebrate Animals form to the animal care supervisor for completion of the “Certification by Animal Care Supervisor.”
4. If the experiment involves procedures described in paragraph 6 of the International Science Fair (ISF) Regulations for Experiments with Animals which do not cause “painful reactions” or “injury” to the animal as prohibited by the California education Code, bring the Certification of Humane Treatment of Live Vertebrate Animals form to the biomedical scientist who will supervise the research. The biomedical scientist must become familiar with the research plan before completing the “Certification by Biomedical Scientist.”

Regulations for Experiments with Human Subjects

Because federal regulations have become increasingly more rigid, students must plan carefully before undertaking research which involves the use of human subjects in either behavioral or biomedical studies. This will protect subjects from unnecessary exposure to physical or psychological risks and experimenters and schools from legal complication.

1. A human subject is legally defined as a person about whom an investigator (professional or student) conducting scientific research obtains:
 - a. data through intervention or interactions with the person or
 - b. identifiable private information
2. A subject at risk is legally defined as any individual who may be exposed to the possibility of injury, including physical or social injury, as a consequence of participation as a subject in any research.
3. Students using human subjects must comply with all regulations that reflect the will of society and plan proper methodology for the protection of those subjects. It is essential that they be alert to humane concerns at all times.

The following steps must be taken before any student begins research involving human subjects:

1. The student completes the “Research Plan” section of the Certification of Compliance of Research Involving Human Subjects (Form No. 601-067) and submits it to the sponsoring teacher.
2. The sponsoring teacher reviews the “Research Plan” and determines if any potential physical, psychological or social risk involved.
 - a. If none is apparent, the teacher signs the certification. (No additional certification is necessary.)
 - b. If any question exists, the student must redesign the experimental study or plan a different study.

Note: Any project involving human subjects that is developed with the advice and assistance of personnel at a medical/scientific organization must comply with any regulations of that organization and requires approval of its Institutional Review Board and Informed Consent Certification.

All project involving human subjects must be accompanied by a signed Certification of Compliance of Research Involving Human Subjects at the time of registration for the Los Angeles County Science & Engineering Fair. Projects without proper certification *will not be accepted.*

Additional Information

Additional information concerning these regulations or the Science Engineering Fair may be obtained from:

Dean Gilbert
Curriculum and Instructional Services – Science – Clark
Los Angeles County Office of Education
9300 Imperial Highway
Downey, CA 90242-2890 (562) 401-5486

Hickory Elementary School

Topics and Ideas

Suitable Science Projects are those that increase and direct a child's interest and competency in science. Worthwhile projects are those which are problem centered and in which the process is important not those which center on showmanship or gadgetry. Some categories of appropriate problems for all elementary science fair are:

1. Observation of the environment: What kinds of trees seem to grow best in our environment? What living things may be found in a cubic foot of soil? How do some insects change as they grow? These are the simplest types of problems, involving a study of the surroundings to classify and organize what is there.
2. Demonstration of a basic principle of science: How does electricity travel? What causes erosion? These are not really research problems, for the answer is known at the start. Their value is in enabling the student to clearly explain the basic idea.
3. Collecting and analyzing data: What is the average October weather like in our town? What is the rate at which a pet drinks water? How does the number of seeds produced by different plants compare? Is there a relationship between the phases of the moon and the weather? In this type of problem there is a manipulation of nature by the student but there are directed and recorded quantitative observation, which is merely descriptive. Computation of averages, ratios, rates, and performance of other analytic processes will be part of this type of project.
4. Controlled experimentation: What is the effect of temperature on the activity of mealworms? What is the effect of the moon phases on the germination of seeds?

Teeth	Gerbil Training	Electrical Robot
The Digestive System	Guinea Pigs	Electric Motor
Tissues of Life	Horses	The Electric Cell
How the Heart Works	The Earth and the Universe	What is a Photoelectric Cell
Blood	Crystals	Telephones-Past and Present
Can You See How You Hear?	Rocks, Minerals and Their Uses	The Telegraph
The Anatomy of Lungs	What is inside Our Earth?	The Speaking Telegraph
A Comparative Study of Bone Joints	What Pollutes Our Water?	Transistorized Rain Detector
The Kidney	Causes of Faulting	Electrostatics
How Does Exercise Affect the Human Heart	Caves	How a Doorbell Works
The Eye and Glasses: A Team For Better Vision	Stalagmites	Burglar Alarm
Orthodontia	Glaciers Past and Present	Five-way Radio Transmitter
Effects of Smoking	Clouds Local Weather	Building a Two-transistor Diode
Drugs and You	Weather-A Fact of Life	Radio
The Human Body	Effects of the Earth's Atmosphere	Teaching Machines
Calcium, iron, Vitamins A and C	What Are the Effects of Air on Earth?	Light
Early Man	Sidereal and Solar Days	Optical Illusions
Animals and Plants	Airplane Simulation	Reflections of Light Form a mirror
Flowers and Plants	The World Beyond Us	Color and Light
Bacteria	The Moon	Grinding a Mirror for a Reflecting Telescope
Cheese	Planets	Photography
Sprouts	Stars and Planets	Solar Energy
Herb Gardens	The Solar System	Solar Water Heater
House plants	Why do the Plant's Rotate Around the Sun?	What is a Solar Furnace
Carnivorous Plants	Physical Principles, Machines and Technology	Wind Power
Life Cycle of Plants and Animals	Technology	Hydroelectric Power
Bees or Dragon Flies	Simple Machines	Physical Properties of Fluids
Silk Moths	Bridges	Fractional Distillation
Seashells	How a Canal Lock Works	Ph Factors
Shark and Teeth	Paper Recycling	Hydraulic Press
Fish of Fox River	Natural Dyeing of Wool	Two Cycle Engines
Amphibians	Conductors	Four-cycle Engines
Frog Chameleons	How Electricity Works	Atomic Energy
Snakes Dinosaurs	Insulation	How an Airship Flies
Birds	Good Conductors of Electricity	Hot Dog Cooker
The Incredible Chicken	Electrical Circuits	
Beaver Lodge and Dam	Uses of Electromagnet	

Hickory Elementary School
Science Fair 2010

ENTRY FORM

Student's Name: _____

Grade: _____

Check Appropriate Category:

Grades 1-3

Model _____ Collection _____ Observation _____
Demonstration _____ Experiment _____

Grades 4-5

Demonstration of Scientific principle _____
Experiment using the scientific method _____

Science project title _____

Brief description _____

Parent's Signature:

Teacher's Signature:

Hickory Elementary School
Science Fair 2010

Procedures To Be Used For Experiments

This paper is for your use. You may want to copy your information onto another sheet of paper.
This information must be included with your project.

A. Question: (What I want to find out)

B. Hypothesis: (What I think will happen)

C. Materials needed:

D. Procedure: (What I am going to do)

1. _____

2. _____

3. _____

4. _____

5. _____

