RULES AND REGULATIONS

GREATER SAN DIEGO SCIENCE AND ENGINEERING FAIR (GSDSEF) – 2005–2006

www.gsdsef.org

WHO MAY ENTER

1. Any 7th through 12th grade student attending a public, private or parochial school in San Diego or Imperial Counties may enter a project in the local school or area science fair. If no such fair is held, the student should ask her/his project advisor to contact the person responsible for screening in that school district, i.e.,

San Diego City Schools

Mary Domb Mikkelson
Vice-President, School Relations
GSDSEF
4558 Aragon Drive
San Diego, CA 92115-4115
Phone – (619) 265-2698
FAX – (619) 265-1439
E-mail – gsdsef_mary@pacbell.net

San Diego County Schools

Nancy Taylor
Department of Education
6401 Linda Vista Road
San Diego, CA 92111
Phone – (858) 292-3854
FAX – (858) 576-9827
E-mail – ntaylor@sdcoe.k12.ca.us

San Diego Diocese Schools

Pat Bannon
Diocese of San Diego
San Diego Diocese Education Office
P.O. Box 85728
San Diego, CA 92186-5728
Phone – (858) 490-8244
FAX -- (858) 490-8272
E-mail -- pbannon@diocese-sdiego.org

Imperial County Schools

Denise Cabanilla
Student Activities Coordinator
Imperial County Office of Education
1398 Sperber Road, Bldg. A
El Centro, CA 92243
Phone: 760-312-6498
FAX: 760-312-6576
E-mail – dcabanilla@icoe.org

2. Group projects are not accepted by the Greater San Diego Science and Engineering Fair.
3. Projects may be entered in the following divisions and categories:

DIVISIONS

a. Junior -- grades 7 and 8
b. Senior -- grades 9 through 12

CATEGORIES -- FINAL PLACEMENT DETERMINED BY THE SCIENTIFIC REVIEW COMMITTEE

Category descriptions adapted from Intel ISEF Handbook

a. **Behavioral and Social Sciences** – Human and animal behavior, social and community relationships – psychology, sociology, anthropology, archaeology, ethnology, linguistics, learning, perception, urban problems, reading problems, educational testing, etc.

b. **Biochemistry** – Chemistry of life processes – molecular biology, molecular genetics, enzymes, photosynthesis, protein chemistry, food chemistry, hormones, etc.

c. **Botany** – Study of plant life – agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, algae, etc.

d. **Chemistry** – Study of nature and composition of matter and laws governing it – physical chemistry, organic chemistry {other than biochemistry}, inorganic chemistry, materials, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.

e. **Computer Science** – Study and development of computer hardware, software engineering, internet networking and communications, graphics {including human interface}, simulations/virtual reality or computations science (including data structures, encryption, coding and information theory).

f. **Earth Science** – Geology, mineralogy, physiography, oceanography, meteorology, climatology, speleology, seismology, geography, etc.

g. **Engineering** – Technology; projects that directly apply scientific principles to manufacturing and practical uses – civil, mechanical, aeronautical, chemical, electrical, photographic, sound, automotive, marine, heating and refrigerating, transportation, environmental engineering, etc.

h. **Environmental Sciences** – Study of pollution (air, water and land) sources and their control; ecology

i. **Mathematics** – Development of formal logical systems or various numerical and algebraic computations and the application of these principles – calculus, geometry, abstract algebra, number theory, statistics, complex analysis, probability.

j. **Medicine and Health** – Study of diseases and health of humans and animals – dentistry, pharmacology, pathology, ophthalmology, nutrition, sanitation, pediatrics, dermatology, allergies, speech and hearing, etc. *Note: Gerontology – the study of the aging process in living organisms – is a separate Intel ISEF category. Such projects would probably be placed in Medicine and Health at the GSDSEF.*

k. **Microbiology** – Biology of microorganisms – bacteriology, virology, protozoology, molds, fungi, bacterial genetics, yeast, etc.

l. **Physics** – Theories, principles and laws governing energy and the effect of energy on matter – solid state, optics, acoustics, particle, nuclear, atomic, plasma, superconductivity, fluid and gas dynamics, thermodynamics, semiconductors, magnetism, quantum mechanics, biophysics, etc.

m. **Space Science –** Astronomy, planetary science, etc.

n. **Zoology** – Study of animals – animal genetics, ornithology, ichthyology, herpetology, entomology, animal ecology, paleontology, cellular physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, etc.

o. **Product Testing/Consumer Science (JUNIOR DIVISION ONLY)** – quality control, comparison studies of product designs -- using accepted engineering tests to obtain quantifiable results, etc.

4. Screening Committees select projects (at school/area fairs) to be considered for entry in the Greater San Diego Science and Engineering Fair (GSDSEF).

JUDGING STANDARDS

1. Creativeness -- Originality of the problem, uniqueness of approach and interpretation of data should be commensurate with the student's grade level. Ingenious use of equipment and materials is considered regardless of the expense of the items involved.

2. Scientific Thought/Engineering Project Goals/Computer Project Goals

   a. Scientific Thought -- The project shows depth of study and effort in employing scientific procedures in the solution of a clearly defined problem (including background study, organized procedures, appropriate sampling, orderly recording and analysis of data and the formulation of logical conclusions).

   b. Engineering Project Goals -- The project has a clear objective relevant to the needs of the potential user. The product or process has been tested and is both workable and feasible economically and ecologically.

   c. Computer Project Goals -- The project has a clear objective, has been thoroughly tested and documented and is both practical and workable.

NOTE: In-depth mathematics, computer and engineering project guidelines may be found in the Science Fair Checklists (Junior and Senior Editions)

3. Thoroughness -- The study is complete within the scope of the problem. Scientific literature has been searched, experiments repeated and careful records kept.

4. Skill -- Credit is given for special skills needed for the construction or use of equipment and for mathematical, computational, observational and design skills.

5. Clarity -- The purpose, procedures and conclusions are clearly explained orally and through the display. The project notebook is well organized, neat and accurate. Sources of ideas, data and assistance are clearly identified.

BASIC RULES

1. **The GSDSEF Management Committee reserves the right to reject projects as unsafe/unsuitable for display.**

2. Participants will submit their *Applications for Entrance* and all other required documents before the stated deadlines.

3. The following forms MUST HAVE BEEN COMPLETED AS REQUIRED AND APPROVED BY THE TEACHER/ADVISOR PRIOR TO THE START OF THE STUDENT'S RESEARCH (approval subject to confirmation by the GSDSEF Scientific Review Committee at screening and/or upon application to the Fair):

   a. "Student Science Project Proposal, Project Description and Pre-Screening Form" (GSDSEF Form 1, 2006) **(MUST BE AVAILABLE AT SCREENING – SHOULD NOT BE SUBMITTED WITH *APPLICATION FOR ENTRANCE*)**

   b. "Certification of Humane Treatment of Live Vertebrate Animals" (GSDSEF Form 2, 2006) – for projects involving animals **(MUST BE AVAILABLE AT SCREENING AND SUBMITTED WITH *APPLICATION FOR ENTRANCE*)**

   c. "Certification of Compliance of Research Involving Humans" (GSDSEF Form 3, 2006) – for projects involving human subjects/interviewees **(MUST BE AVAILABLE AT SCREENING AND SUBMITTED WITH *APPLICATION FOR ENTRANCE*)**

   d. "Certification of Hazards Control" (GSDSEF Form 4, 2006) – for projects involving BACTERIA; MOLDS OR FUNGI; PROTOZOA; CHEMICALS; TOXIC, CORROSIVE, MUTAGENIC, CARCINOGENIC, TERATOGENIC OR INFECTIOUS AGENTS; VENOMOUS ANIMALS OR POTENTIALLY HAZARDOUS SUBSTANCES OR DEVICES – ANYTHING SO LABELED OR WHICH, IF NOT HANDLED PROPERLY, CAN CAUSE INJURY **(MUST BE AVAILABLE AT SCREENING AND SUBMITTED WITH *APPLICATION FOR ENTRANCE*)**

   e. "Certification of Vertebrate Tissue Source and Safety" (GSDSEF Form 5, 2006) – for projects involving human or other vertebrate animal tissue (including teeth & hair roots), blood, blood products & body fluids. **(MUST BE AVAILABLE AT SCREENING AND SUBMITTED WITH *APPLICATION FOR ENTRANCE*)**

4. Only one exhibit per student!

5. Projects that are a continuation of a previous exhibit must involve **significant new experimentation**. State in title, i.e. "2nd Year Study, 3rd Year Study." Notebooks from previous projects should be available to screeners and judges.

6. One table, 76 cm (30 in.) high or one floor space (without table) will be provided for each project. Outside measurements for each project are limited to 76 cm (30 in.) deep, front to back; 122 cm (48 in.) wide, side to side; 274 cm (108 in.) high, floor to top {198cm (68 in) high from table surface}.

SAFETY PRECAUTIONS

1. Fire regulations prohibit use of highly flammable materials or decorations in project displays. Background panels must be of masonite, pegboard, hardboard, wood or foam-core board (**purchased commercial backboards may also be used**), to which poster paper, cardboard or fabric may be securely attached. Lights may not be attached to boards.

2. **Nothing that could be hazardous may be displayed during judging**. This includes:

    a. live disease-causing organisms that are pathogenic to humans or other vertebrates

    b. microbial cultures and fungi, live or dead, including unknown specimens

    c. food, either human or animal

    d. syringes, pipettes and similar devices

    e. any flames, open or concealed

    f. potentially hazardous substances [including chemicals] and devices

    g. highly combustible solids, fluids or gases. Inert substitutes MUST be used if such materials re required for display. NOTE: Rockets MUST NOT contain fuel.

    h. Tanks that have contained combustible gases, including butane and propane, unless they have been purged with carbon dioxide

    i. Liquids (**including water, which poses a threat to the floor finish at the Activities Center**)

    j. Dry ice

    k. Sublimating solids

    l. Living or preserved organisms – animal or plant; see #s 5, 6 & 7 on next page

3. Devices producing temperatures in excess of 100^{o} C must be adequately insulated.

4. The following electrical safety rules must be observed:

    a. Wiring must be properly insulated and fastened.

    b. Wiring, switches and the metal parts of high voltage circuits must be located out of reach of observers and must include an adequate overload safety device.

    c. High voltage equipment must be shielded with a grounded metal box or cage to prevent accidental contact.

    d. Approved connecting cords of the proper load-carrying capacity must be used for 110-volt operation of lights, motors, transformers and other equipment.

    e. Standard switches must be used for 110-volt circuits. Open knife switches or bell-ringing push buttons are not acceptable for circuits exceeding 12 volts.

    f. Batteries with open top cells (wet cell batteries) are not permitted.

    g. Electrical connections in 110-volt circuits must be soldered or fixed under approved connectors and have connecting wires properly insulated.

h. Electrical circuits for 110-volt AC must have an Underwriters Laboratories approved cord (of proper load carrying capacity) at least 2 meters long and equipped with a standard grounded plug.

i. Devices (vacuum tubes, lasers, etc.) that generate dangerous rays must be properly shielded.

j. Only Class I and Class II (not Class III or IV) lasers may be operated at the Fair. These lasers must 1) have a protective housing or barricade preventing human access to the beam during operation; 2) be disconnected from the power source when not being operated; 3) be operated only in the presence of the exhibitor and 4) when displayed, be accompanied by a sign reading -- LASER RADIATION; DO NOT STARE INTO BEAM.

5. NO live or preserved vertebrate or invertebrate animals or parts (including embryos, microbial cultures or fungi -- whether known to be disease-causing or not) may be exhibited at the Fair. Sealed insect collections will be permitted on display.

6. No human parts, other than teeth, hair (without roots), nails and histological sections (properly acquired) may be exhibited at the Fair.

7. No photographs or other visual presentations depicting vertebrate animals in other than normal conditions may be displayed on the student's exhibit.

8. Any Controlled Substances (drugs, chemicals, anesthetics, narcotics, etc., the use of which is regulated by the Comprehensive Drug Abuse Prevention and Control Act of 1970) must be acquired and used in accordance with existing local, state and federal laws. See your pharmacist or write the State Department of Health for information about these laws. Such substances may not be exhibited at the Fair. **The use of many such substances is prohibited by the GSDSEF. Please contact Philip D. Gay – (619) 697-2024 or phlwen@pacbell.net -- regarding any proposed use of a controlled substance in developing a science fair project**.

9. All Recombinant DNA research must be carried out in accordance with the latest NIH Guidelines for Research Involving Recombinant DNA Molecules. Only research normally conducted without containment in a microbiological laboratory and performed under the supervision of an appropriately qualified scientist will be permitted. The facilities to be used must be described in the research plan. **Research requiring containment is prohibited**

10. **Projects involving tobacco; tobacco products; smokeless powder; black powder; explosives; the manufacture of rocket fuel and/or alcohol/other intoxicants or gasohol (or the production of these), are prohibited. PLEASE NOTE, IN ADDITION, THAT STUDENTS MAY NOT LOAD OR RELOAD ANY AMMUNITION WITH GUNPOWDER, ETC. Please contact Scientific Review Committee (SRC) Chair Philip D. Gay – (619) 697-2024 or phlwen@pacbell.net -- for information regarding these regulations.**

REGULATIONS FOR EXPERIMENTS WITH ANIMALS

Students planning research involving live vertebrate animals or animal parts MUST, BEFORE acquiring them (in the case of pets or livestock, BEFORE starting experiments):

1. become familiar with the California Education Code, Intel International Science and Engineering Fair (Intel ISEF) and Greater San Diego Science and Engineering Fair (GSDSEF) regulations stated below
2. read and complete the Greater San Diego Science and Engineering Fair "Certification of Humane Treatment of Live Vertebrate Animals" form (GSDSEF-2, 2006) -- including ALL required signatures.
3. submit it to your teacher for approval and signature **(approval subject to confirmation by the GSDSEF Scientific Review Committee (SRC) at screening and/or when application is made to the Fair)**.

Both the *Student Science Project Proposal, Project Description and Pre-Screening Form* **(GSDSEF-1, 2006)** and *Certification of Humane Treatment of Live Vertebrate Animals* **(GSDSEF-2, 2006)** must appear in the student's notebook at screening. If the student is invited to apply for admission to the GSDSEF, GSDSEF-2 must be submitted with the *Application for Entrance*.

CALIFORNIA EDUCATION CODE PROVISIONS

Any student research involving animals MUST COMPLY with the requirements of the CALIFORNIA EDUCATION CODE stated here:

State of California Education Code Title 2, Division 2, Part 28, Chapter 4, Article 5, 51540

In the public elementary and high schools or in 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 a manner to cause 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 instruction in the normal practices of animal husbandry.

PERTINENT EXCERPTS FROM INTEL INTERNATIONAL SCIENCE AND ENGINEERING FAIR (Intel ISEF) ANIMAL REGULATIONS

Compliance with the following ISEF regulations is also required. **However, the provisions of the CALIFORNIA EDUCATION CODE must be followed whenever conflicting regulations occur.**

1. 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.

2. 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), vertebrated embryos and fetuses and chicken embryos prior to three days (72 hours) of hatching, must have clearly 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.

3. Animal Defined: The International Rules define an animal as any live, nonhuman vertebrate, mammalian embryo or fetus, bird eggs within three days (72 hours) of hatching, and all other vertebrates at hatching or birth.

4. To provide for humane treatment of animals, an animal care supervisor knowledgeable in the proper care and handling of experimental animals **(may be teacher or parent)** 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.

5. All live or 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. **NOTE: Pet store animals are inappropriate for experimentation as their genetic background, age and past nutritional status are difficult to obtain.**

6. 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.

GSDSEF ANIMAL REGULATIONS

1. Student Research involving animals/animal parts **MUST COMPLY** with the requirements of the California Education Code, the GSDSEF and the Intel International Science and Engineering Fair (Intel ISEF) -- see last page of GSDSEF Form 2, 2006**. In case of conflict, the provisions of the California Education Code take precedence.**

2 GSDSEF Form 2, 2006, *Certification of Humane Treatment of Live Vertebrate Animals*, must be attached to GSDSEF Form 1, "Student Proposal for Science Project," and approved by the teacher/advisor **PRIOR TO** the start of experimentation **(approval subject to confirmation by the GSDSEF Scientific Review Committee at screening and/or upon applying to the Fair)**. Once approved, it must be displayed when the project is exhibited at the school or area Fair and, if the student is invited to apply for admission to the GSDSEF, submitted with the Application for Entrance.

NOTE: The "Certification by Biomedical Scientist" must be completed for research involving studies other than observations of animals in their natural environment.

3. The biomedical scientist must provide continuing supervision to assure compliance with the protocol.

4. Major deviations from the approved protocol may be implemented only with the written approval of the biomedical scientist.

5. The biomedical scientist must be in the same locality as the student for the duration of the experimental work except for short trips. This means that a project started in one city may not be continued in another unless a designated adult supervisor (an individual who has been properly trained in the techniques and procedures to be used in the investigation), approved by the biomedical scientist prior to the continuation of the experimental work, agrees to supervise the project.

6. 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.

7. Experiments involving procedures not in violation of the “painful reaction” or “injured” restrictions of the California Education Code are permitted if certified by a qualified biomedical scientist PRIOR TO the beginning of the investigation. **NOTE: GSDSEF rules do not permit students OR their adult supervisors, as part of a student-planned/conducted project, to 1) perform surgery; 2) conduct experiments involving toxicity, nutritional deficiency or harmful physical or psychological stress or 3) perform the sacrifice (humane euthanasia) of live vertebrate animals. Projects designed with the intent to harm or kill ANY animal are prohibited.**

REGULATIONS FOR EXPERIMENTS WITH HUMAN SUBJECTS/INTERVIEWEES

THE NEW HIPAA REGULATIONS REGARDING PATIENT RECORDS AND CONFIDENTIALITY MAY WELL AFFECT WHETHER A PROJECT IS SUITABLE FOR STUDENT DEVELOPMENT. NO IDENTIFIABLE PERSONAL INFORMATION MAY APPEAR IN YOUR RECORDS OR PROJECT NOTEBOOK OR ON YOUR DISPLAY. ALL

SUBJECTS MUST SIGN A PERMISSION SLIP ALLOWING THE STUDENT TO USE DATA COLLECTED AND THESE SLIPS MUST BE KEPT IN A SEALED ENVELOPE AND MADE AVAILABLE TO SCREENERS. A SAMPLE PERMISSION SLIP SHOULD BE INCLUDED IN THE REPORT. IF ANY QUESTION EXISTS AS TO THE PROPRIETY OF THE PROPOSED PROJECT, THE STUDENT/TEACHER MUST CONTACT PHIL GAY, 619-697-2024, phlwen@pacbell.net.

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

1) The student completes the "Research Plan" section of Form GSDSEF-3 ("Certification of Compliance of Research Involving Human Subjects") 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 is involved.

   a) If none is apparent, the teacher signs the certification **(approval subject to confirmation by the GSDSEF Scientific Review Committee at screening and/or application to the fair).**

   b) If any question exists, the student must redesign the experimental study or plan a different study.

3) Projects involving exercise or other strenuous activity or in which subjects are given caffeine – coca Cola, coffee, etc. – or over-the counter products or food supplements must have their protocols analyzed by and/or be supervised by a medical doctor. Ingestion of other substaces – e.g., nuts (possible allergen) or sugar (possible diabetic subjects) – may also require medical supervision (should be determined on a case by case basis).

The approved **GSDSEF-3, 2006** AND **GSDSEF-1, 2006** (*"Student Science Project Proposal, Project Description and Pre-Screening Form"*) **MUST** be included at the front of the project notebook when exhibited at the School Science Fair and, if the student is invited to apply for admission to the Greater San Diego Science and Engineering Fair, **GSDSEF-3, 2006 MUST** be submitted with the student's *Application for Entrance*.

NOTES:

1. Student researchers may not use professional psychological (or other) tests without the written approval of the author(s).

2. Student researchers must obtain written permission from each subject/interviewee to be used in the study (or, if under the age of 18, from their parents/guardians). **Studies conducted in classrooms with the teachers' consent may be certified by the teachers involved. NOTE: ALL PERMISSION SLIPS MUST BE ON DISPLAY AT SCREENING. IF INVITED TO APPLY TO GSDSEF, STUDENT SHOULD SUBMIT A PHOTOSTAT OF ONE (1) WITH APPLICATION FOR ENTRANCE. ORIGINALS SHOULD BE KEPT FOR POSSIBLE STATE OR INTERNATIONAL FAIR APPLICATIONS.**

3. Any project involving human subjects/interviewees that is developed with the advice and assistance of personnel at a medical/scientific organization must also comply with any regulation of that organization requiring approval of its Institutional Review Board and Informed Consent Certification.

4. Identifiable personal or medical information may not be included.

5. The rights and privacy of human subjects/interviewees must be respected at all times.

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 complications. {For example, the law is very clear about disclosure of medical information: "This information may be disclosed to…accredited public or private nonprofit educational or health care institutions for bona fide research purposes. However, no information so disclosed shall be further disclosed by the recipient in any way which would permit identification of the patient." (California Civil Code, Section 56.10, (c),(7).}

A human subject is legally defined as "a person about whom an investigator (professional or student) conducting scientific research obtains 1) data through intervention or interaction with the person or 2) identifiable private information."

A subject at risk is legally defined as "any individual who may be exposed to the possibility of injury, including physical, psychological or social injury, as a consequence of participation as a subject in any research."

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.

PROCEDURES FOR PROJECTS INVOLVING:

- **BACTERIA**
- **MOLDS OR FUNGI**
- **PROTOZOA**
- **CHEMICALS**
- **TOXIC, CORROSIVE, MUTAGENIC, CARCINOGENIC, TERATOGENIC OR INFECTIOUS AGENTS**
- **VENOMOUS ANIMALS**
- **POTENTIALLY HAZARDOUS SUBSTANCES OR DEVICES (Anything so labeled or which, if not handled properly, can cause injury)**

Students **MUST** complete form **GSDSEF-4, 2006**, *Certification of Hazards Control* and have it approved by their supervising scientist, teachers/advisors and parent/guardian -- **BEFORE** starting projects involving these substances (**approval subject to confirmation by the GSDSEF Scientific Review Committee at screening and/or when application is made for admission to the Fair.)**

The approved **GSDSEF-4, 2006** AND **GSDSEF-1, 2006** ("*Student Science Project Proposal, Project Description and Pre-Screening Form*") **MUST** be included at the front of the project notebook when exhibited at the school science fair and, if the project is invited to apply for admission to the Greater San Diego Science and Engineering Fair, **GSDSEF-4, 2006 MUST** be submitted with the student's *Application for Entrance*.

2005-2006 RULE CHANGES FROM INTEL INTERNATIONAL SCIENCE AND ENGINEERING FAIR (ISEF) MUST BE OBSERVED BY GSDSEF STUDENTS

POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS

There have been major revisions regarding:

- **Potentially Pathogenic and Pathogenic Agents**
- **Recombinant DNA**
- **Human and Vertebrate Animal Tissue**

Please review carefully.

- **ALL studies involving the use of microorganisms (including bacteria, viruses, viroids, prions, rickettsia, fungi, and parasites), recombinant DNA (rDNA) technologies or human or animal fresh tissues, blood, or body fluids require pre-approval by the SRC or other appropriate review committee (SRC, IBC, RAC, IACUC).**
- **ALL studies in these areas of research are prohibited in a home environment.**
- **A risk assessment is required for all projects in these research areas. Research projects in these areas of research are now classified into biosafety levels that require appropriate biosafety containment. Essentially, biosafety level 1 research may be conducted in a high school with a trained Designated Supervisor.**
- **Projects Involving Unknown Microorganism (i.e. those collected from the environment) have additional rules and restrictions.**
- **Some tissues do not need to be treated as potentially hazardous biological agents (i.e. plant tissue, established cell lines, hair, etc.) Please see the Additional Rules for Projects Involving Tissues Including Blood and Blood Products for full rules.**
- **All projects involving Potentially Hazardous Biological Agents require the Hazardous Risk Assessment Form (6A). Projects involving tissues, including blood and blood products, require the additional Vertebrate and Animal Tissue Form (6B). Note: Links to these forms may be found at www.sciserv.org/isef/.**

HAZARDS CONTROL -- SPECIAL CONSIDERATIONS

Following are examples of precautions that must be taken to prevent injury to persons or the environment. No list could possibly encompass all possible hazards, so teachers, parents and students must carefully plan and follow safe procedures specific to each study. **THE METHODS AND MATERIALS SECTION OF THE PROJECT DESCRIPTION MUST CONTAIN EXPLICIT AND DETAILED STATEMENTS AS TO HOW AND WHERE EXPERIMENTS WILL BE CONDUCTED.** Include all hazards you anticipate or encounter and necessary precautions on GSDSEF-4, 2003 (in the section "Safety Precautions to be Exercised During Procedures").

1. All cultures in petri dishes must be sealed with two tapes on opposite sides immediately after exposure. Examine through lids only. Dispose of as possible pathogen (biohazard bags or sterilization).

2. All bacteria, protozoa and fungi (including molds) are to be handled as though pathogenic. Pathogenic bacteria are not to be cultured. Pure cultures of nonpathogenic microorganisms should be used in experiments. When soil or water is used as a source of bacteria (or fungi), it is important to collect samples unlikely to be contaminated by human pathogens. For example, water should be collected from lakes, estuaries or beaches free of sewage or animal-waste pollution and never from areas suspected to be or posted as polluted. Collection of soil samples in or around old building sites, animal burrows and/or areas in which Valley Fever is endemic should be avoided.
3. **Bacterial studies must be conducted in a properly equipped laboratory under qualified supervision*. Petri dishes may be inoculated at home but must be IMMEDIATELY SEALED and taken to the lab**.
4. Petri dishes that are inoculated with materials containing unknown microorganisms (i.e., the material is not a pure non-pathogenic culture) must not contain blood agar or BHI, but rather nutrient or trypticase soy agar.
5. Manipulation of molds must take place in a fume hood or open-air area (to prevent contamination of living areas with fungal spores). If anyone in the area has a depressed or damaged immune system or any allergies, experiments with molds must be conducted in a laboratory. Containers must be sealed at all times during observations and disposed of as possible pathogens.
6. Approved eye-protective devices should be used by all persons performing science activities involving hazards to the eyes. All persons in close proximity must be similarly equipped. Laboratory aprons and rubber or plastic gloves should be available and should be worn whenever hazards exist that could damage clothing, injure someone or irritate skin.
7. Eyes and skin must not be exposed to ultraviolet light experimentally or accidentally as part of a project.
8. The use of especially hazardous chemicals should be avoided and substitutes used. If the use of certain hazardous chemicals (e.g., gel preparations of Acrylamide, a neurotoxin, or Ethidium Bromide, a mutagen) cannot be avoided, extra precautions must be exercised and any procedures which involve exposure to these hazards must be performed by the supervisor. Consult *Materials Safety Data Sheets (MSDS)* prior to use of any hazardous chemicals. **Student use or handling of Ethidium Bromide or gel stained with Ethidium Bromide is prohibited. If a necessary part of the experiment, they must be handled only by qualified lab personnel trained in the standards for their use. Care must be taken that student does not come into contact with them.**
9. **Projects involving tobacco; tobacco products; smokeless powder; black powder; explosives; the manufacture of rocket fuel and/or alcohol/other intoxicants or gasohol (or the production of these), are prohibited. PLEASE NOTE, IN ADDITION, THAT STUDENTS MAY NOT LOAD OR RELOAD ANY AMMUNITION WITH GUNPOWDER, ETC. Please contact Scientific Review Committee (SRC) Chair Philip D. Gay – (619) 697-2024 or phlwen@pacbell.net -- for information regarding these regulations.**
10. The use of Controlled Substances (drugs, chemicals, anesthetics, narcotics, etc. which are regulated by the Comprehensive Drug Abuse Prevention and Control Act of 1970) must be in accordance with existing local, state and federal laws. See your pharmacist or write the State Department of Health for information about these laws. The use of many such substances is prohibited by the GSDSEF. **Please contact Philip D. Gay – (619) 697-2024 or phlwen@pacbell.net -- regarding any proposed use of a controlled substance in developing a science fair project.**
11. Arrangements must be made to assure proposed procedure is safe before any project proposal is approved. When specialized safety equipment and/or facilities (e.g., fume hoods, clinical laboratory) are necessary, arrangements must be made in advance.
12. Other hazardous or potentially hazardous procedures, materials or devices must be specified.

***Requests for approval of procedures (to be performed at hospital, university or other professional labs) that include activities such as transfer or microscopic identification of unknown bacterial cultures must include detailed information/statements on safety procedures and equipment, i.e., "the following procedures will be conducted by the laboratory supervisor" or "these procedures will be conducted in a bacteriological hood using the following additional precautions."**

PROCEDURES FOR PROJECTS INVOLVING HUMAN OR OTHER VERTEBRATE TISSUES

Students **MUST** complete form **GSDSEF-5**, **2006** *Certification of Vertebrate Tissue Source and Safety* and have it approved by their supervising scientists, teachers/advisors and parents/guardians -- **BEFORE** starting projects involving these substances (**approval subject to confirmation by the GSDSEF Scientific Review Committee at screening and/or when application is made for admission to the Fair**.)

The approved **GSDSEF-5, 2006** AND **GSDSEF-1, 2006** ("*Student Science Project Proposal, Project Description and Pre-Screening Form*") **MUST** be included at the front of the project notebook when exhibited at the School Science Fair and, if the project is invited to apply for admission to the Greater San Diego Science and Engineering Fair, **GSDSEF-5, 2006 MUST** be submitted with the student's *Application for Entrance*.

HUMAN OR OTHER VERTEBRATE TISSUES -- SPECIAL CONSIDERATIONS

Following are examples of precautions which must be taken to prevent inappropriate use of, or injury from, human or other vertebrate tissue to persons or the environment. No list could possibly foresee all possible situations, so teachers, parents and students must carefully plan and follow safe procedures specific for each study. Include all related concerns you anticipate or encounter and necessary precautions on GSDSEF-5, 2006 (in the section "Safety Precautions to be Exercised During Procedures).

1. **If human blood, blood products or tissue (including hair roots) is used, the student must obtain (in addition to the completed forms GSDSEF-1, 2006 and GSDSEF-3, 2006) a signed statement, on laboratory letterhead, that any human tissue, body fluids, blood and blood products have been tested and certified free of human immunodeficiency virus (HIV) and Hepatitis B and C antibodies and antigens prior to the student receiving the material.**
2. **If human teeth are used the student must, before receiving them, obtain (in addition to the completed forms GSDSEF- 1, 2006 and GSDSEF-3, 2006) a signed statement, on organizational letterhead, that any human teeth provided are certified free of blood and blood products or specifying approved procedures that have been followed to assure no hazard from HIV or Hepatitis B or C remains.**
3. **Tissues from vertebrate animals must be acquired from institutional researchers and be from either a continuously maintained tissue cell culture line or from animals already being used in an on-going institutional research project. In either case, a clear statement including the phrase "from a continuously maintained tissue (or cell) culture from "lab" or "tissue was obtained as a by-product of ongoing research in a laboratory at _____."**
4. **Arrangements must be made to ensure that any proposed procedure is safe before any project proposal is approved. Whenever specialized safety equipment and/or facilities (e.g., fume hoods, clinical laboratory) are necessary for a procedure, arrangements must be made in advance.**
5. **Other vertebrate tissue concerns not listed above must be specified.**