Official Rules and Entry Forms
for the

2020 KERN COUNTY REGIONAL SCIENCE FAIR

Middle School and Senior High Division (6-12)

March 16-17, 2020
Rabobank Convention Center

Sponsored by
Aera Energy LLC, founding sponsor
with Chevron

through
The Kern County Superintendent of Schools Office

Kern County Science Foundation
1300 17th Street - CITY CENTRE
Bakersfield, CA 93301-4533

REGULATIONS REGARDING ELECTRONIC DEVICES

-READ CAREFULLY-

Although electronic devices such as student cell phones are permitted at the Kern County Science Fair, the following guidelines will be enforced:

- All devices (phones, games, etc.) should be set to silent or vibrate mode
- No talking on phone
- No taking photos or video on phone
- Disengage from all portable devices as judges approach your project-first impressions are important!
- Be respectful of your neighbors as they are being judged

We appreciate your support of these guidelines which will promote a quiet and respectful environment for both judges and participants.

Failure to adhere to the above policies may result in devices being removed by the floor coordinators.

KERN COUNTY REGIONAL SCIENCE FAIR

Important Dates

December 16, 2019:	**School/District Intent to Participate Deadline**
January 24, 2020:	**"Restricted Project" Deadline**
January 24, 2020:	**Student Project Entry Form Deadline** *Entries after January 24, 2020 may be accepted for display only, but will not compete for awards.*
March 16, 2020:	**Project Set-Up** ***Rabobank Convention Center*** *2:00 pm - 7:00 pm ONLY*
March 17, 2020:	***Doors Open*** *8:00* a.m.
	Speaker *9:00* a.m.
	Judging *(Students Present)* *10:00* a.m. - *1:00 p.m.*
	Public Viewing *1:00 p.m. - 3:00 p.m.*
	Awards Program *3:00 p.m. (Grades 4 & 5) and 4:00 p.m. (Grades 6-12)*
	Project Removal *5:00 p.m. - 6:00 p.m*

IMPORTANT REMINDERS

- The Science Review Committee will place each project in its appropriate category. The committee decisions are final.
- Each participating school should plan to send a representative to one of the coaches' workshops on either Thursday, September 12, 2019 or Tuesday, October 9, 2019. In order to enter Restricted Projects, workshop attendance is strongly encouraged.

All registration and restricted project approvals will be submitted through the online registration system.

https://ca-kern.zfairs.com

Introduction: What the Science Fair is about

Scientists do some of the most important and interesting work in our society, and try to find answers to questions by observing and doing experiments. They then think about what they observe and the results of their experiments. Sometimes they get a definite answer to their questions; sometimes the results lead to new questions and new experiments. As this process goes on, they understand more and more. The Science Fair will give you a chance to actually do the kind of things scientists do. You will find out that it really is possible to ask questions about our world and get answers to those questions. And most of all, you will learn a lot and have fun doing it.

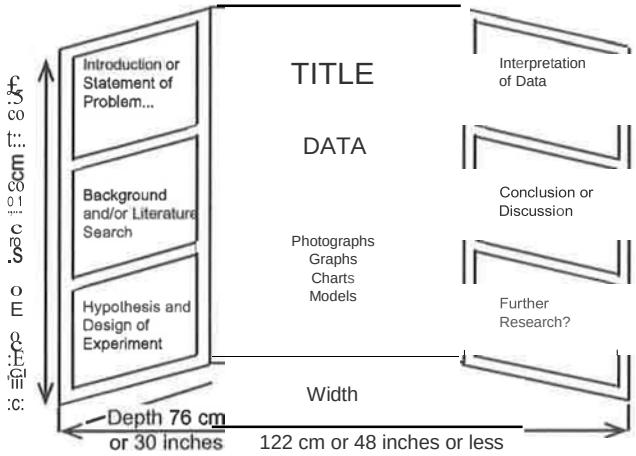
Rules for Entering a Project in the Kern County Regional Science Fair, Middle School and Senior High Division

1. Your school or district must register its intent to participate. In addition, the science fair coach or representative should attend one of the coaches' workshops on either September 12, 2019 or October 9, 2019. Coach attendance is strongly encouraged for entering restricted projects.
2. You must be a Kern County student in grades 6-12.
3. Your project must be selected by your school or school district.
4. You must register for the Kern County Regional Science Fair by January 24, 2020 at https://ca-kern.zfairs.com
5. Projects entered after January 24, 2020 will be for display only. They will not be judged and will not be eligible for awards.
6. Only one project may be submitted by a student. Team projects are allowed but a team size cannot exceed three students. For team projects, each member of the team must complete a separate registration account. Prior year's projects are not eligible for submission unless the project is part of a longitudinal study.
7. For restricted projects you must get approvals through the online registration system https://ca-kern.zfairs.com
8. There is an entry fee of $15.00 *per student.* Please note that it is not the intent of the Kern County Science Foundation to eliminate any student from competition because of an inability to pay. In such cases, please contact the Kern County Science Foundation at (661) 636-4640.
9. Each student is responsible for the entry fee. However, some schools may pay fees for all students.
10. The quality of the project must be acceptable for entry in the Kern County Regional Science Fair. This means that the project should:
    a. Exhibit the scientific method. It must ask a question, suggest an answer, and then see if the answer is correct by performing one or more experiments and analyzing the experimental results. Projects which only are collections, demonstrations of scientific principles, or summaries of scientific literature are unlikely to do well unless they are used as part of a scientific investigation.
    b. Show a level of knowledge that is appropriate to the student's grade level but beyond what is normally found in grades 6-12 textbooks.
    c. Be complete.
11. Applications may be rejected for not following one or more of the above rules.

Send entry fees to the Kern County Regional Science Fair, 1300 17th Street, City Centre, Bakersfield, CA 93301-4533. They must be received on or before January 24, 2020

Project Display Rules

1. The project display board must be sturdy and self-standing. There are three sizes of project display boards. Size "A" must fit within a rectangular space that is 81 cm (32 inches) wide by 38 cm (15 inches) deep and can be no more than 91 cm (36 inches) tall. Size "B" (shown on following page) must fit within a rectangular space that is 122 cm (48 inches) wide by 76 cm (30 inches) deep and can be no more than 198 cm (78 inches) in height measured from the table or, for size "C", 274 cm (108 inches) in height measured from the floor. Displays which are admitted but are later changed to exceed these space limitations will be disqualified until brought into compliance. See the diagram below for some idea of what a table display might look like.



This is the suggested exhibit format for project size "B".
To organize and display your project, use your own creative ability

2. Projects must be set up and ready for judging before judging begins.
3. Students must be present at their display during the judging period or the project will not be judged. For team projects, at least one half of the team members must be present. (One team member for a team of two; two team members for a 3-person team.)
4. The student's *original* laboratory notebook must be present for inspection during judging. However, it would be a good idea to have the notebook on display *only* during the judging period.
5. Electronic media such as computers or video displays may be used. If a video presentation is included, there is no assurance that the judges will view all or part of it. In any case the duration of a video presentation should be no more than two minutes.
6. Projects requesting electrical power will be provided with one 110 volt outlet. You must bring your own UL approved 25 foot three-prong grounded extension cord. The Science Fair does not provide extension cords.
7. No gas or water outlets are provided.
8. No flames are permitted.
9. No glass items are permitted.
10. Use of dry ice is not permitted.
11. Photographs which identify the student or team members are fine. Other people may be shown in photographs only with their written permission. [Public Health Service Act, 42, USC 241(d)]. See Forms Section.
12. No liquids are permitted.

13. Fair officials reserve the right to remove any project or item(s) which they deem hazardous or inappropriate, including cell phones found to be in use during judging.
14. The following items may **NOT** be displayed and are not allowed in the Science Fair premises.
    a. Anything you cannot afford to lose. The Science Fair does not take responsibility for lost or stolen items.
    b. Contraceptives.
    c. Cultures of bacteria or molds.
    d. Hazardous or otherwise dangerous materials or items. This includes glassware, mercury, medicines of any kind, controlled substances, and materials which are corrosive (such as acids), easily flammable, toxic (poisonous), radioactive, or carcinogenic (cancer causing). Any sub- stance labeled "keep out of reach of children" is considered potentially hazardous.
    e. Human parts.
    f. Hypodermic syringes.
    g. Live animals, plants or food, or other living things.
    h. Preserved animals, including animal parts or fluids (examples: teeth, blood, other body fluids, bones, feathers, animal tissue).
    i. Sharp items such as razor blades, knives, and dissection kits.
    j. Soil.
    k. Unlabeled containers.
    l. Photographs, drawings, or descriptions which are offensive.
15. At least five (5) copies of your abstract must be available at your display. You will give one of these to each judge when he/she interviews you.

IMPORTANT: LOSS OR DAMAGE Valuable equipment, such as computers or scientific instruments, may be used as part of the display only if the **student participant** takes full responsibility for any loss or damage. Any valuable items should be on display only when the student is present, including the judging period. The Kern County Regional Science Fair assumes no responsibility for loss or damage of any project or a part of any project. Students should retain copies of their laboratory notebooks and other printed materials.

Categories

Science Fair officials will review all Project Abstracts and assign projects to the appropriate categories. Intermediate Division categories may include, but are not limited to: Animal Sciences, Behavioral Sciences, Biochemistry, Cellular and Molecular Biology, Chemistry, Computer Science, Earth and Planetary Science, Energy and Transportation, Engineering: Electrical and Mechanical, Engineering: Materials and Bioengineering, Environmental Management, Environmental Sciences, Materials and Product Science (Grades 4-8 only), Mathematical Sciences, Medicine and Health Sciences, Microbiology, Physics and Astronomy, and Plant Sciences. The Science Fair officials may develop additional categories as needed.

Awards

A certificate of participation will be presented to each exhibitor.
Medallions will be presented to the top three projects in each category or group of categories if they are combined for judging. Honorable mention ribbons may be awarded to other students at the discretion of the judges. Scholarships may be available through the Kern County Science Foundation for high school seniors. For information see https://kern.org/science-foundation/scholarships/ First and second place winners in each category in the middle school and senior high school divisions *may be* eligible to participate in the CA State Science Fair. However, being in a category with a limited number of entries does NOT mean an automatic invitation to the CA State Fair.
Judges are asked to recommend which projects should advance to State competition. Additional awards, some monetary, are often presented in addition to the above listed awards to individuals or even schools.

Participation in the CA State Fair is optional. Application fees, deadlines, transportation and housing are the responsibility of the participant.

By participating in the Kern County Regional Science Fair, student, parent, teacher and coach agree to the following creed:

Participant's Creed

I am a parent, coach or student participating in the Kern County Regional Science Fair. I agree that I will be courteous and model good sportsmanship at all times. I am aware that the decisions of the judges is final. I will respect the judges' decisions and discuss any concerns with the event coordinator in a respectful manner.

School Responsibilities

Selection of projects selected must:

- Meet Science Fair criteria for scientific quality.
- Meet all guidelines and submission deadlines, including those for Restricted Projects.
- Be completed under safe conditions

Rules and Regulations School officials should be thoroughly familiar with the Science Fair participation rules and Restricted Project regulations. School official signatures are **required** for all students through the online registration system https://ca-kern.zfairs.com

and, if needed, on some restricted projects forms. School official approvals are not required on the Qualified Scientist/Designated Supervisor Form unless a staff member meets the guidelines as a qualified scientist or designated supervisor (advanced science degree in appropriate field). A school representative is strongly encouraged at one of the coaches' workshops on either **September 12, 2019 or October 9, 2019** in order to enter restricted projects.

Teacher/Adult Sponsor The school must designate a Teacher/Adult Sponsor for each student project entered. The Teacher/Adult Sponsor is responsible for the health and safety of the student conducting the research and of humans or animals used as subjects. This individual reviews the student's project plan to make sure that experimentation is done within local, federal and Kern County Regional Science Fair rules, ascertains that approvals are submitted by other adults involved in approving or supervising any part of the project, and certifies that the project is sponsored by the school as an official entry in the Kern County Regional Science Fair. The Teacher/Adult Sponsor may call upon a Qualified Scientist (one with an earned doctoral/professional degree in the biomedical sciences or other appropriate discipline) or Designated Supervisor for approval(s) required for Restricted Projects. The Teacher/ Adult Sponsor must acknowledge on the entry form that the student has complied with all research regulations. This is particularly important for Restricted Projects.

Institutional Review Board For some projects, those involving human subjects, for example, an Institutional Review Board should review the proposed Research Plan. This Board should be established at the school site, if possible, and consists of 1) a teacher, 2) a school administrator, and 3) one of the following: psychologist, psychiatrist, medical doctor, or nurse. The nurse may come from a school district, county office, or private agency. IRS members should be familiar with State, Federal, and Science Fair regulations. If a school has difficulty in establishing an Institutional Review Board, assistance is available from the Science Fair Coordinator. Names and professions of IRB members must be reported to the Kern County Regional Science Fair on the Institutional Review Board Information Sheet.

Student Forms The Teacher/Adult Sponsor has the responsibility for registering the school and students as well as restricted project approvals on or before the appropriate deadline.

School Participation Quotas are based on size and history of participation; each school has been given its quota. Call (661) 636-4640 or email miroy@kern.org if you have any questions.

Projects will be selected by the local school. It is recommended that this selection be based on school science fair competitions.

Student/Parent Responsibilities

Each student is responsible for following the rules of the Kern County Regional Science Fair, including online registration, meeting restricted project and other deadlines, fee payments, and project completion. Students should check with their teacher/adult sponsors to make sure they have created their own account and registered the school.

After January 24, 2020, projects may not be entered for competition.

Kern County Regional Science Fair Location

The Science Fair will be held at the Mechanics Bank Convention Center, 1001 Truxtun Ave., Bakersfield, CA, 93301.

Travel to the Mechanics Bank Convention Center

Take California Avenue exit (east) to Chester Avenue .

Take Chester Avenue north to Truxtun Avenue.

Take Truxtun Avenue east to the Mechanics Bank Convention Center.

Notice of News Media Visit
(Photography/Filming/Interview}

1. Local news media representatives may wish to [either come on campus or cover this event] and interview, photograph/film students.
2. So long as news media representatives conduct business in a responsible manner, school officials may not control content, limit access to pupils, restrain a pupil's right to speak freely with news media representatives, or restrict the use of information and images acquired by news media representatives.
3. If on campus, news media representatives will be accompanied by school officials for the sole purpose of minimizing disruption to the educational environment. If off campus, news media representatives will not be accompanied by school officials.
4. Although school officials may not limit access to pupils or restrain a pupil's right to speak freely with news media representatives, parents may direct their child not to approach news media representatives.

5. Upon request by news media representatives, school officials may provide directory information, including but not limited to the name of a pupil, school of attendance, grade level, honors, and activities, unless the pupil's parent/guardian has submitted a written request that this information not be disclosed.
6. School officials will not release information that is private or confidential as required by law, board policy, or administrative regulation. No other access to student records or personally identifiable student information will be provided without written parent/guardian permission.
7. If you have particular concerns in light of this notification, please call Christine Goedhart-Humphrey at (661) 636-4330.

What makes a good science fair project?

A good Science Fair project involves the student in a journey of discovery, driven by curiosity. It typically starts with an interest in some scientific subject, such as biology or geology. As a result of learning about the subject, the student may propose a *hypothesis* and then do further background research. The student then develops an experimental procedure that will produce data, from which she/he can draw conclusions to prove or disprove the hypothesis. More often than not, new *hypotheses* will result from the experiment, leading to new experiments, which might be done in the future.

A hypothesis typically takes the form of "If I do this, then that should happen." **A good hypothesis is not just a guess about what might happen if something is done, however. It is based on some knowledge of the subject, usually gained from reading and observation.** A quality Science Fair Project directs the student's efforts toward a particular result or expectation; undirected experimentation just to find out what happens is play, not science (although notable discoveries have been made in this manner, they are notable because they were "accidents").

Your science fair project should include the following steps:

Conduct background reading and study.
Write a hypothesis.
Do further reading and study.
Develop an experimental procedure to investigate the hypothesis.
Obtain or construct the apparatus needed for the procedure.
Operate the apparatus or conduct the procedure to collect experimental data. Record the data as you collect it.
Repeat the procedure and record new data to make sure that you are getting reliable results.
Analyze the experimental data.
Arrive at conclusions.
If necessary, propose new hypotheses and new experiments that result from your conclusions. These might even be part of a future science fair project.

The final step before coming to the Science Fair is to prepare a display to illustrate all of the above and to re-hearse (but not memorize!) the following:

An explanation of the hypothesis.
A description of the experimental procedures and how you conducted the experiment(s).
How you developed the experimental results and conclusions.
An explanation of the results and conclusions.

It is important to understand that proving your hypothesis is NOT the purpose of a Science Fair project. It is the intent of the Science Fair that you go through the process of asking questions and performing experiments in an attempt to find answers. You may not get an answer to your question, but that doesn't mean you have not

done good science. Real scientists often do many experiments before they begin to get answers to scientific questions.

Teachers and Parents are advised to encourage students to develop a project that genuinely interests them. Judges will often ask students why they chose to do a particular project, and it usually turns out that the best work is done by students who are motivated and inspired by their curiosity about what they are investigating. Students who developed a project simply because a teacher or parent expected them to do so often will produce mediocre results.

Types of Projects to Avoid The following types of projects are unlikely to receive awards at the Kern County Regional Science Fair and will not be invited to compete at the California State Science Fair.

Artwork, photographs, or replicas (physical or computer-generated) that illustrate concepts but were not used or are not useful as experimental apparatus to collect data. Depictions of known scientific concepts are in this category.
Experiments that indicate the students have not done rudimentary background research (e.g., they could have seen the experiment described in a textbook).
Displays of collections of things (unless the collections are used for research that leads to Scientific conclusions).
Experiments that merely find out "What happens if I do this?" without having a scientific reason for performing the procedure.
Presentation of theories with no credible attempt at proof (e.g., using literature search of quotes to provide evidence for the theory).
Experiments that present results without analyses that predict, quantify, show why those results occurred, or explain how they occurred.
Experiments that do not check data points for repeatability or neither resolve nor explain widely divergent results.
Experiments using apparatus so crude that measurements could not be realistically acquired to show the intended results.

The above section was written principally by Anita Gale with assistance from the California State Science Fair Judging Policy Advisory Committee and was revised and condensed by Robert Allison of the Kern County Science Foundation.

What to Expect and Some Tips on How to Prepare for the Judging Process

1. **Please remember that the judges are volunteering their time. Their decisions will be based on their best judgment and Science Fair guidelines and will be final.**
2. Be aware that the judges appreciate a display that clearly shows the intent and results of experimentation, and a presentation that concisely describes what was done and what was concluded. The judges want to feel that you are familiar enough with your project to discuss it comfortably and answer questions about it. Memorized speeches or rambling descriptions of trivial details hinder the work of judges, who need to be able to pose good questions in order to thoroughly understand the project. If you work on a team project, the judges will expect more substantial science.
3. You should prepare an oral summary of important points that you can present in no more than 60 seconds. Your judges will already have read your abstract, so if you've done a good job there your summary will remind them of questions that occurred to them earlier.
4. Following your summary, you may find it useful to present several prepared short descriptions of important aspects of your project. You know your project better than anyone, so you should have the best ideas of what is important. You should prepare answers for such questions as "Where did you get the idea for this project?" "What is special or distinctive about your project?" "What is the next thing you would do with your results?" "What questions has your project now generated?" You might also prepare for the questions you hope the judges will ask.

5. For team projects, one person could act as the team spokesperson and present the oral summary or this job could be shared among the team members. In any case, all team members should understand their roles clearly and be able to carry them out. This summary should include the rationale for the project being a group, rather than an individual, enterprise, and how each member contributed. Each member of the group should be fully knowledgeable about the project and be prepared to discuss his/her part.
6. You will be interviewed by at least two different judges for your category who will spend about five to eight minutes discussing your project with you. The judges may talk to you one at a time or in groups. It is difficult to space these interviews equally, so don't get discouraged if there is a long wait between judges. Don't worry about comparing the number of your judging sessions with your neighbors. You, or they, may be getting Special and Recognition Awards interviews.
7. Many judges prefer to learn about your project by asking questions. Be prepared for them to interrupt your presentation.
8. You probably will not be able to predict all of the questions you will be asked. Some of the judges are experts in their fields, so they may ask you questions you cannot answer. Don't let this bother you. Just answer truthfully and to the best of your ability. If you don't know the answer to a question, say so. DO NOT try to "snow" or bluff a judge.
9. The Kern County Regional Science Fair is a major local event. Your interviews with the judges might be covered by newspaper reporters (some with photographers), radio reporters, TV cameras (with their bright lights) and others. Videos might be used in promotional materials for future science fairs.

The above section was adapted and revised from material first prepared for the California State Science Fair.

Restricted Projects

A restricted project is any project which may require additional adult supervision due to potentially harmful materials or machinery (ie., firearms), handling of non-human vertebrates, or topics involving human subjects. All restricted projects require special approval **before you can begin.** Project supervision by a Qualified Scientist or Designated Supervisor is required. In addition, approval by the school Institutional Review Board and/or the Scientific Review Committee sometimes will be needed. Project advisors, whether they are teachers or qualified scientists/designated supervisors, must certify their approval(s) through the online registration system that the student has complied with all project regulations.

The **Qualified Scientist** must possess an advanced earned degree (examples, Ph.D., M.D., D.D.S.) in a field related to the project. Further, he/she must be familiar with all regulations - local, state and federal - which re- late to that project. The Qualified Scientist and the Teacher/Adult Sponsor may be the same person if qualified as indicated above, as long as that person is not the student's parent.

Designated Supervisor supervises the work approved by the Qualified Scientist. Generally this person will have practical experience related to the specific project to be supervised. Such projects can include those involving DNA, animal tissues, human research, hazardous materials, toxins, or controlled substances.

Designated supervisors might be 4-H project leaders, butchers, farm advisors, single subject credentialed teachers, police officers, or others, depending on the project. The Teacher/Adult Sponsor may act as a Designated Supervisor.

Scientific Review Committee (SRC) This committee is convened by Kern County Superintendent of Schools and reviews all Restricted Projects. Its formal approval is required for some projects.

In general terms, the Designated Supervisor is the person who promises to provide additional supervision in the course of a project. That can include anything necessary to insure a student's safety. Examples might

be overseeing a student who is using bleach, lighting a match or climbing a ladder. If a student is surveying strangers, the Designated Supervisor would remain nearby in order to guarantee that the student is in a safe environment.

A project which requires a Qualified Scientist is one which needs a higher level of scientific oversight. Examples might include supervision for a student handling chemicals or medications. Projects using animals would need a scientist willing to oversee the humane treatment of those animals.

The County's Scientific Review Committee will evaluate the risks associated with each project and determine if there is a need for either a Designated Supervisor or a Qualified Scientist. The decisions of the Committee are final.

The following pages include descriptions and the forms/approvals needed for each type (I-VIII) of restricted project. These have been included in the forms section of this booklet.

I. Human Subjects (includes sections A, B and C)

- Approval by the school Institutional Review Board (IRB)
- Completion of the following forms:
  - Qualified Scientist or Designated Supervisor Form
  - Human Subjects Form
  - Informed Consent Form
  - Human, Animal Tissue, and Microorganisms Form, if using human tissue

A. Rules

1. All research projects involving human subjects must be reviewed and approved by an Institutional Review Board (IRB) before the research begins.
2. Human subjects research includes projects involving: Subjects participating in physical activities (e.g., physical exertion, ingestion of any substance, any medical procedure), psychological and opinion studies (e.g., survey, questionnaire, test of any kind), behavioral observations, studies in which the researcher is the subject of the research.
3. When developing the Research Plan student researchers must evaluate and minimize the physical and/or psychological risks to their human subjects.
4. The documentation of written Informed Consent is required for most projects. Children/Minors participating in most research will require special consent procedures including assent of the child/minor and consent of the parent/guardian. Children/Minors are persons who have not attained the legal age for consent; in most jurisdictions the legal age is 18.
5. Research conducted by a pre-college student at federally registered research institutions (e.g., universities, medical centers, NIH, correctional institutions , etc.) must be reviewed and approved by that institution's IRB. A copy of the IRB approval for the entire project (which must include the research procedures/measures the student is using) or an official letter from the IRB attesting to this approval is required. A letter from the mentor is not sufficient documentation of IRB review and approval.
6. A student may observe and collect data for analysis of medical procedures and medication administration only under the direct supervision of a qualified professional. The qualified professional must be named in the research protocol to be specifically approved by the IRB. Students are prohibited from ad- ministering medications and performing medical procedures on human subjects. The IRB must confirm that the student is not violating the medical practice act of the particular state or nation in which he/she is conducting the research.
7. Student researchers may NOT publish or display information in a report that identifies the human subjects directly or through identifiers linked to the subjects (including photographs), without written consent. (Public Health Service Act, 42, USC 241 (d)).
8. All standardized tests that are not in the public domain must be administered, scored and interpreted by a qualified scientist as required by the instrument publisher. Any and all use and distribution of the test must be in accordance with the publisher's requirements, including procurement of legal copies of the instrument.

9. The use of the Internet to obtain data for human subjects research is permissible. The Student Researcher, Adult Sponsor and IRB must take additional care to ensure that survey responses remain confidential and that, when required, informed consent is documented.
10. Any proposed changes to a previously approved research plan must be resubmitted to the IRB for another complete review. The proposed changes must not be implemented until the modified project is approved by the IRB.

B. Risk Evaluation

Once a study population is chosen, the student researcher must assess any potential physical and/or psychological risks when developing the research plan. In evaluating risk, students and IRBs must use the following federal definition of minimal risk as a guide: No more than minimal risk exists when the probability and magnitude of harm or discomfort anticipated in the research are not greater (in and of themselves) than those ordinarily encountered in DAILY LIFE or during performance of routine physical or psychological examinations or tests.

Risk Groups The following risk groups require additional safeguards because they have been judged as vulnerable to coercion or undue influence:

1. Any member of a group that is naturally at-risk (e.g., pregnant women, individuals with diseases such as cancer, asthma, diabetes, cardiac disorders, psychiatric disorders, dyslexia, AIDS, etc.).
2. Special vulnerable groups that are covered by federal regulations (e.g. children/minors, prisoners, pregnant women, mentally disabled persons, or economically or educationally disadvantaged persons).

Risk Activities The following are examples of activities that contain more than minimal risk:

1. Physical
   a. Exercise other than ordinarily encountered in DAILY LIFE by that subject.
   b. Ingestion of any substance or exposure to any potentially hazardous materials.
2. Psychological
   a. Any activity (e.g. survey, questionnaire, viewing of stimuli) or experimental condition that could potentially result in emotional stress. For example, answering questions related to personal experiences such as sexual, physical or child abuse and divorce and/or psychological well-being (e.g. depression, anxiety, suicide) must be considered more than minimal risk. Additionally, research activities that involve exposing subjects to stimuli or experimental conditions that could potentially result in emotional stress must also be considered more than minimal risk. Examples include violent or distressing video images, distressing written materials or activities that could potentially result in feelings of depression, anxiety, or low self-esteem in subjects.
   b. Any activity that could potentially result in negative consequences for the subject due to invasion of privacy or breach of confidentiality. When research activities involve collection of personal information (e.g. history of abuse, drug use, opinions, fingerprints) or health-related data (genetic material, blood, tissue) the researcher must consider risks related to invasion of privacy and possible breach of confidentiality. Ways to reduce these risks include collecting data anonymously or developing data collection procedures that make it impossible to link any identifying information (e.g. subject's name) with his/her responses or data.

C. Informed Consent

The process of obtaining informed consent provides information to the subject about the risks and benefits associated with participation in the research study and allows the subject to make an educated decision about whether or not to participate. Informed consent is an on-going process, not a single event that ends with a signature on a page. It must incorporate procedures that do not involve coercion or deception.

Documentation of informed consent is required.

If a research subject is under 18 years of age, both the parent/legal guardian and the school age research subject must sign the Informed Consent Forms. In some cases, the Scientific Review Committee

may allow a roster of names, rather than an individually signed form from each participant. For surveys needing to protect the anonymity of participants, the Scientific Review Committee may allow the student researcher to assign numbers to participants. An individual determination will be made for each proposed research study.

Patient Privacy HIPAA, the Health Insurance Portability and Accountability Act, as well as the Code of Federal Regulations 45 CFR 46 §46.102 now have **very strict regulations on research on human subjects and privacy rights.** It is essential that any projects involving human subjects comply with these regulations. Regulations involving humans as the subject of research:

The Code of Federal Regulations 45 CFR 46 §46.102 defines:

"Human Subject" means a living individual about whom an investigator (whether professional or student) conducting research obtains (1) data through intervention or interaction with that individual, or (2) identifiable private information. In order for the obtaining of private information to constitute research involving human subjects, the identity of the subject must be readily associated with the information.

"Minimal Risk" means that the risks of harm anticipated in the research are not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. Examples of unacceptable risk include: (1) ingestion or physical contact with any potentially hazardous materials including toxic chemicals, known or suspected pathogens or carcinogens, or exposure to ionizing radiation; (2) intentionally inducing emotional stress through questioning or invasion of privacy; (3) physical stress to pregnant women or anyone suffering debilitating physical illness; and (4) psychological stress to the mentally handicapped or those suffering psychiatric disorders. This list is intended to be illustrative, not exhaustive.

The regulations of the Fair are intended to protect human subjects, both physically and psychologically. The regulations supplement, and do not supplant, relevant State and Federal regulations dealing with such protection.

II. Nonhuman Vertebrate Animals

Approval by the IRB

Completion of the following forms:

- Qualified Scientist or Designated Supervisor Form
- Certification of Humane Treatment of Live Animals Form

This includes live, nonhuman vertebrates, mammalian embryos or fetuses, bird eggs within three days of hatching, and all other vertebrates (fish, amphibians, reptiles, etc.).

Field Studies

These are observational, behavioral, and natural history studies that do not affect an animal's health or well-being.

Animal Experimentation

These are research projects other than field studies and must adhere to the guidelines outlined below.

Students proposing research on nonhuman vertebrate animals first should explore all possible alternatives. These may include cells and tissue cultures, plants (including lower plants such as yeast or fungi), mathematical or computer models, invertebrates with either no nervous systems or primitive ones (i.e., protozoa, planaria, or insects), or chicken embryos prior to three days of hatching.

If vertebrates are used for research and testing, the student and his/her Teacher/Adult Sponsor are responsible for maintaining the well-being, comfort, and humane treatment of the animals before, during, and after the research. Every effort should be made to reduce the number of animals involved and refine procedures to minimize their distress. In addition:

All research animals must be legally acquired from reputable animal breeders; wild animals may not be used for experiments (see field studies, above, for exception).
Experiments involving small common animals such as mice, rats, hamsters, guinea pigs, gerbils or rabbits are only allowed in an institutional or school setting, and not in a student's home (see field studies, above, for exception).

Regulations for projects using any live vertebrate animal, excluding humans:

The State of California Education Code §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 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 instruction in the normal practices of animal husbandry.

III. Pathogenic Agents

Approval by the IRB
Completion of the following forms:

- Qualified Scientist Form
- Human, Animal Tissue, and Microorganisms Form
- Human Subjects Form, if humans are part of the experimentation
- Informed Consent Form, if humans are part of the experimentation
- Certification of Humane Treatment of Live Animals Form, if non-human vertebrates are part of the experimentation

Any bacteria, viruses, rickettsia, fungi, molds, or parasites collected, isolated and/or cultured from any environment during student research projects should be considered potentially pathogenic (disease causing). **No research will be allowed on unknown bacteria. This includes swabbing surfaces and culturing them to try to find out what germs are present. Research using bacteria will be allowed only on known strains which are non-pathogenic. The research must be under the supervision of a trained teacher or qualified scientist, and Federal regulations must be followed.** For example, the effectiveness of an antiseptic may be tested using a known non-pathogenic strain acquired from a scientific source such as Flinn Scientific or Carolina Biological.
Students working with any microorganisms must always follow standard microbiological practices (for example, National Institute of Health and National Association of Biology Teachers guidelines). **Students must not use ethidium bromide or handle gels stained with ethidium bromide.** All research must be conducted under the direction of a Qualified Scientist in a laboratory setting.

IV. Recombinant DNA

Approval by the IRB
Approval by the Scientific Review Committee
Completion of the following forms:

- Qualified Scientist or Designated Supervisor Form
- Human, Animal Tissue, and Microorganisms Form
- Human Subjects Form, if humans are part of the experimentation
- Informed Consent Form, if humans are part of the experimentation
- Certification of Humane Treatment of Live Animals Form, if non-human vertebrates are part of the experimentation

Students working with any microorganisms, whether or not they involve DNA, must always follow standard microbiological practices (for example, National Institute of Health and National Association of

Biology Teachers guidelines). **Students must not use ethidium bromide or handle gels stained with ethidium bromide.**

Recombinant DNA studies may be conducted on bacterium *Escherichia,* bacterium *Bacillus subtilus,* and yeast *Saccharomyces cerevesiae* in non-federally registered laboratories, including school laboratories, under the direct supervision of a trained teacher following federal regulations. Students wishing to study non-exempt forms must work only in a federally registered research institution under the direct supervision of a Qualified Scientist.

V. **Human and Animal Tissue:**

Approval by the IRS
Approval by the Scientific Review Committee (exceptions: see following page)
Completion of the following forms:

- Qualified Scientist or Designated Supervisor Form
- Human, Animal Tissue, and Microorganisms Form

This includes all human or vertebrate animal tissue and body fluids (for example, saliva and urine).

Some tissue types do not require prior SRC review and approval:

Established cell and tissue cultures (e.g., those obtained from the American Type Culture Collection with culture source and number identified)

- **USDA approved meat or meat by-products from food stores, restaurants or packinghouses.**

Although students using their own blood do not need HIV or hepatitis certifications, students wishing to conduct research on human blood, blood products or other body fluids not their own may do so only under the following conditions: a) tissue fluids are documented to be free of HIV and hepatitis B and C before the student receives them, or b) tissues are handled in accordance with standards and guidelines set forth in OSHA, 29CFR, Subpart Z, 1910.1030 – *Blood Borne Pathogens.*

Regulations for projects using tissue samples:

Live tissue samples must be taken either from a continuously maintained tissue culture line already available to institutional researchers, or from animals already being used in an on-going institutional research project. **Students may not be involved in the direct acquisition of these samples from living human or vertebrate animals.**

VI. **Controlled Substances**

Approval by the IRS
Completion of the following forms :

- Qualified Scientist or Designated Supervisor Form
- Human Subjects Form, if humans are part of the experimentation
- Informed Consent Form, if humans are part of the experimentation
- Certification of Humane Treatment of Live Animals Form, if non-human vertebrates are part of the experimentation

Projects using controlled substances are not allowed, but surveys of adult users of such substances are permitted. Drug Enforcement Administration classified substances, prescription drugs, alcohol, and tobacco must be acquired and used according to existing local, state, and federal laws. Students under 21 years of age are prohibited from purchasing and/or handling smokeless powder or black powder.

VII. Hazardous Substances

Some examples of hazardous substances are hydrochloric acid, household bleach and chemicals. Use of dry ice is prohibited.

Approval by the IRB
Completion of the following forms:
- Qualified Scientist or Designated Supervisor Form

VIII. Firearms

Approval by the IRB
Hunter safety certificate
Student must be age 12 or over
Completion of the following forms:
- Qualified Scientist or Designated Supervisor Form

Students will find a rules wizard to help them navigate the approvals that must be submitted for restricted projects.
https://ruleswizard.societyforscience.org/

Application Checklist and Calendar

Form	Who	Due
Restricted project forms	Projects with restrictions requiring approvals	January 24, 2020
Student Entry Form	ALL participants	January 24, 2020
Entry fee ($15.00) (payable to Kern County Science Foundation)	ALL participants	January 24, 2020

Application Procedure Summary

1. Register through the online registration system by January 24, 2020.
   https://ca-kern.zfairs.com

2. Complete Student Entry Form and turn it in with your $15.00 per person fee by January 24, 2020. Turn it in to a teacher/adult sponsor or directly to the Science Fair.
3. Any projects submitted after January 24, 2020 may be admitted for display but will not be eligible for competition or prizes.

Filling out the Student Entry Form

General considerations

Go to https://ca-kern.zfairs.com

- To register, click on **Create Accoun**t to the right, then select **Student**.
- To update your profile, click on your name (above right).
- For technical assistance, click here:
  - https://wiki.zfairs.com/index.php?title=Students
- Science Fair officials will review all Project Abstracts and assign projects to the appropriate categories.
- Only students in grades 6-12 may compete as groups (2-3 students).
- Only students in grades 6-12 will have access to electrical outlets.
- Only students in grades 9-12 will be considered for ISEF qualification.

Project Summary and Abstract

Project title- This should be a short description of the project and cannot exceed 120 letters. It should clearly state the subject and not be so general or "cute" that a judge or a member of the public will not be able to understand what it is about. For example, if your project is to study the effect of color on visibility of automobiles, your title might be: *The Effect of Color on the Visibility of Automobiles When Viewed at Various Distances.*

Abstract-This information is vital because it is what Fair officials use to place your project in the appropriate category. The abstract is also very important because it will be read by the judges before they see your project and have a chance to talk with you about it. They will not use the abstract by itself to judge your project, but it will be their first impression of your work. In addition, the judges will prepare some of their interview questions after reading your abstract.

Please bring five (5) copies of your abstract to the Kern County Regional Science Fair so that all judges may review it before judging begins.

The abstract must contain the following:

Hypothesis-State your hypothesis, objective or goal. This will be the basis for your project. Examples: *The lighter the color of an automobile, the farther away it can be seen.* Or you might say it this way: *The objective of this project is to determine the effect of automobile color in the distance from which* a *person can see it.*

Experimental methods and materials-Describe the experimental design, including the materials and methods you used. Example: *Five automobiles, identical except for color, were driven between two marked locations four miles apart. Twenty people observed the automobiles from the same location at the same time on* a *cloudless day. Each person recorded the time when he or she first saw each automobile. All observers were between the ages of 15 and 17; 10 were male and 1O were female; all provided informed consent.*

Results-Summarize your results and, if necessary, explain how they relate to your hypothesis, objective or goal. Example: *70% of the males and 90% of the females saw the white car first; 90% of males and 60% of females saw the black car last and none saw it first. Most of the subjects saw the other cars in the following order: light blue and gray the same, then metallic orange.*

Conclusions and discussion-Relate your experimental results to your hypothesis, objective or goal. Do the results support it, not support it, or are they inconclusive? What did you find out from your project? What might you do differently next time? What further hypotheses and experiments might you do to learn more? What new science did you learn from the project? Example: *White cars are easier to see than black ones. {3ased on the limited sample of other colors, it seems that lighter cars in general are easier to see than darker ones. There-fore I can conclude that my experimental results support my hypothesis. In the future I might do experiments using more car colors which are similar except for their brightness, using various shades of gray, for example. This would eliminate the effect of color on people 's ability to see the cars. Because I did not get the same results with males and females, I learned that there is* a *possibility that gender differences affect how people see. I might want to test this by using greater numbers of males and females.*

Example of completed abstract

The objective of this project was to determine if a *lighter colored automobile could be seen from farther away than* a *darker one. Five automobiles, identical except for color, were driven between two marked locations four miles apart. Twenty people, equal numbers of males and females, observed the automobiles from the same location at the same time on* a *cloudless day. Each person recorded the time when she or he first saw each automobile. All observers were between the ages of 15 and 17. The results showed that* 70% *of the males and 90% of the females saw the white car first; 90% of males and 60% of females saw the black car last and none saw it first. Most saw the other cars in the following order: light blue and gray the same, then metallic orange. Based on the limited sample of colors, it appears that lighter colors are easier to see than darker ones. Therefore the hypothesis was supported. Further experiments might use additional colors, which are similar except for brightness, various shades of gray, for example. Because the results for males and females were different, further experiments could test this by using greater numbers of males and females.*

Help received-Describe any help received while conducting the project. Although the project must be the work of the student, some help is allowed. However, there must be a clear distinction between the work of the student and others. Students participating in a research opportunity in industry, a university, or other institutions besides their school must display only their own research. If a student does a project of this type, the project documentation must include a letter from the principal researcher indicating the level of his/her involvement in the student's project.

INFORMATION FOR RESTRICTED PROJECTS

If you have ever puzzled over the difference between a Designated Supervisor and a Qualified Scientist, this clarification may be helpful:

In general terms, the Designated Supervisor is the person who promises to provide additional supervision in the course of a project. That can include anything necessary to insure a student's safety. Examples might be overseeing a student who is using bleach, lighting a match or climbing a ladder. If a student is surveying strangers, the Designated Supervisor would remain nearby in order to guarantee that the student is in a safe environment.

A project which requires a Qualified Scientist is one which needs a higher level of scientific oversight. Examples might include supervision for a student handling chemicals or medications. Projects using animals would need a scientist willing to oversee the humane treatment of those animals.

The County's Scientific Review Committee will evaluate the risks associated with each project and determine if there is a need for either a Designated Supervisor or a Qualified Scientist. The decisions of the Committee are final.

At the Science Fair
A Checklist for Students

DO bring:

- Chairs for Students
- Snacks (for breaks only; not allowed on floor)
- Plastic water bottles, to be stored under the displays
- Lunch or lunch money
- Something to keep students busy during judging intervals
- Log Books and .§ copies of abstract
- Contact phone number for adult chaperone
- Extension cord if electricity has been requested

Do NOT bring:

- Glass
- Liquids
- Live plants, dirt
- Display photos depicting anyone other than student
- Anything the student cannot afford to lose

Office of Mary C. Barlow
Kern County Superintendent of Schools
1300-17th St. - CITY CENTRE
Bakersfield, Ca 93301-4533
Advocates for Children

2020 Kern County Regional Science Fair School/District Intent to Participate Form

Deadline: Monday, December 16, 2019

Please complete the following and fax to Michelle Roy, (Fax) 661-636-4135

School: _____ **District:** _____

Grade levels at this school: 4 5 6 7 8 9 10 11 12

(Check all the boxes that apply)

_____Our district will be having a district science fair and will send representatives to the Kern County Regional Science Fair. Projects must be registered by January 24, 2020.

_____Our school site will be having a school science fair and will send representatives to the Kern County Regional Science Fair. Projects must be registered by January 24, 2020.

_____ Our school/district **WILL or WILL NOT** allow students to do research on Restricted Projects. The deadline for Restricted Projects submission is January 24, 2020.

ALL COACHES SHOULD PLAN TO ATTEND ONE OF THE SCHEDULED SCIENCE FAIR WORK-SHOPS. EITHER THURSDAY. SEPTEMBER 12. 2019 OR TUESDAY. OCTOBER 9. 2019 from 3:30-5:30 p.m. at KCSOS City Centre in Room 1B. This meeting is strongly encouraged for those submitting Restricted Projects.

Our 2020 Kern County Regional Science Fair contact person is:

Name: _____

Email: _____

Administrator's Signature: _____

Date: _____

Office of Mary C. Barlow
Kern County Superintendent of Schools
1300-17th St. - CITY CENTRE
Bakersfield, Ca 93301-4533
Advocates for Children

NOTICE OF NEWS MEDIA VISIT
(Photography/Filming/Interview)

1. Local news media representatives may wish to ***[either* come *on campus or cover this event]*** and interview, photograph/film students.
2. So long as news media representatives conduct business in a responsible manner, school officials may not control content, limit access to pupils, restrain a pupil's right to speak freely with news media representatives, or restrict the use of information and images acquired by news media representatives.
3. If on campus, news media representatives will be accompanied by school officials for the sole purpose of minimizing disruption to the educational environment. If off campus, news media representatives will not be accompanied by school officials.
4. Although school officials may not limit access to pupils or restrain a pupil's right to speak freely with news media representatives, parents may direct their child not to approach news media representatives.
5. Upon request by news media representatives, school officials may provide directory information, including but not limited to the name of a pupil, school of attendance, grade level, honors, and activities, unless the pupil's parent/guardian has submitted a written request that this information not be disclosed.
6. School officials will not release information that is private or confidential as required by law, board policy, or administrative regulation. No other access to student records or personally identifiable student information will be provided without written parent/guardian permission.
7. If you have particular concerns in light of this notification, please call Christine Goedhart-Humphrey at (661) 636-4330.

Judging Criteria

1. ORIGINALITY/CREATIVITY (30 points)
   a) The problem is original or a unique or unusual approach to an old problem.
   b) Experimental design shows creativity.
   c) Resources - materials and equipment - are used ingeniously.
   d) Application and interpretation of data demonstrate student's creativity and original thinking.
   e) Student shows understanding of unanswered questions.
   f) Project goes beyond textbooks found at the student's grade level.

Poor	Weak	Average	Strong	Exemplary	
0-11	12-17	18-22	23-26	27-30	Score

2. . SCIENTIFIC THOUGHT AND UNDERSTANDING (35 points)
   a) The hypothesis is well stated and based on reading, study and/or observation.
   b) Project demonstrates depth of study.
   c) Student demonstrates depth of knowledge regarding the scientific and/or engineering principles involved.
   d) The experimental design is effective in testing the hypothesis.
   e) Results and conclusions are clearly and honestly stated, and are logical, relevant, and related to the
   f) hypothesis.
   g) Implications of the experimental results are discussed, and one or more further hypotheses and
   h) experiments are suggested.
   i) Student can extrapolate what was learned from the project to the subject in general or to related subjects.

Poor	Weak	Average	Strong	Exemplary	
0-13	14-20	21-25	26-31	32-35	Score

3. ORGANIZATION AND COMPLETENESS (15 points)
   a) The project has a well-defined goal/objective.
   b) Well-organized and executed experimental procedures.
   c) The scientific literature (considering grade level) has been searched.
   d) Experimental data recorded in a careful and orderly manner.
   e) Experiments have been repeated as needed.
   f) Implications of the project fully addressed.
   g) Well-organized display board.

Poor	Weak	Average	Strong	Exemplary	
0-5	6-8	9-11	12-13	14-15	Score

4. EFFORT AND MOTIVATION (10 points)
   a) Amount of time spent on project.
   b) Amount of time conducting background reading and study.
   c) Extent to which depth of background reading and study was reflected in the project.
   d) The student learned a considerable amount about the subject on the project.
   e) The display board was informative and attractive.

Poor	Weak	Average	Strong	Exemplary	
0-3	4-5	6-7	8-9	10	Score

5. CLARITY (10 points)
   a) Original project notebook is available for inspection.
   b) Project notebook is well organized and accurate.
   c) The purpose, hypothesis, procedures, results, and conclusions are clearly stated.
   d) The project title accurately portrays the actual project.
   e) The abstract is clear and well written.
   f) Oral presentations are clear and reflect knowledge of the problem and the basic science underlying it.
   g) Audio-visual materials, including the display board, are clear and relevant to the project.

Poor	Weak	Average	Strong	Exemplary	
0-3	4-5	6-7	8-9	10	Score

Total