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University of South Carolina Upstate

PIEDMONT REGION III SCIENCE FAIR

800 University Way
Spartanburg, SC 29303

October 2018

Table of Contents

Greetings!

Enclosed you will find information you need for the regional fair competition.

A website https://www.uscupstate.edu/outreach/youth/piedmont-regional-science-fair/ and Facebook Event page https://www.facebook.com/events/2178929302354234/ have been created for the Regional Science Fair competition. The website contains many different forms of information (general information, calendar of events, forms, recent winners, and frequently asked questions). The Facebook page is intended to communicate information to both school coordinators and parents quickly, accurately, and efficiently. Please share these resources with the parents of students competing in the Regional Science Fair.

One video about creating a competitive Science Fair project has been created and will be posted on the website soon. The goal this year is to add at least one more video.

If you have questions or would like to have someone discuss the Regional Science Fair with your teachers and/or students, Dr. Stephen Bismarck is available to meet at your school to discuss the Science Fair. He will be available between October 1st and December 8th. Stephen can be contacted at sciencefair@uscupstate.edu

Timeline:

Now through January 11th   School Science Fair Coordinators email regarding participation.

February 26th – March 1st   School Science Fair Coordinators register winners online.

Tuesday, March 5th   **1:00pm to 5:00pm** -- Set up projects at USC Upstate Readiness Center
6:00pm to 8:00pm -- Judging takes place. Only High School students stand by their projects until the judging interview is complete.

Wednesday, March 6th   **9:30am to 7:00pm** -- Science Fair is open to the public

Thursday, March 7th   **9:30am to 7:00pm** – Science Fair is open to the public. Parents and Schools should pick up projects.

PLEASE NOTE: ALL PROJECTS MUST BE PICKED UP BY **7PM ON THURSDAY, March 7th, 2019**. UNCOLLECTED PROJECTS WILL BE DISCARDED AT THIS TIME, AS THERE IS NOT SPACE AVAILABLE AT USC UPSTATE TO HOLD YOUR PROJECT.

Saturday, March 23rd   **10:00am**-- Awards Ceremony in Readiness Center Greatroom

General Information for Schools:

All Schools:

Each school may submit **up to, but no more than 22 projects.
Schools that are K-8 or 6-12 can submit 16 projects for each grade band.**

ALL PROJECTS, 1st through 12th grades, MUST CONFORM TO ISEF (INTERNATIONAL SCIENCE AND ENGINEERING FAIR) GUIDELINES. See section below on Rules, Regulations and Guidelines.

The Judge's Score Card (at the end of this document) is a good blueprint for crafting a competitive Science Fair project. Read it carefully and feel free to share it with all your teachers.

Elementary Schools Grades (1-4):

Elementary Schools are expected to host a local Science Fair to gain winners to compete in the Regional Science Fair at USC Upstate. Only underlined individual projects can be submitted to the regional fair at the elementary school. No team projects please. Students are eligible for this Regional Fair if they are winners at their local fair.

Middle and Secondary Schools:

Middle and Secondary Level students (grades 5-12) may submit team projects (completed by two or three students—no whole class projects). Team projects will be judged with individual projects, not as a separate category. Names of all members of a team, with a team leader listed, should be identified when registering.

Middle Schools are expected to host a local Science Fair to gain winners to compete in the Regional Science Fair here at USC Upstate. Students are eligible for this Regional Fair if they are winners at their local fair.

For Secondary Level students in grades 9-12, a school fair is not required. If you have a promising young scientist or mathematician who will work with a mentor teacher and prepare a project, we welcome them to the Regional Fair.

All Middle and Secondary Level projects selected to compete in the Regional Science Fair must fill out ISEF Checklist Forms and have them available during project registration.

1. **All students must fill out the 1A. Student Checklist/Research Plan Form.**
2. **All teachers must fill out the Form 1: Checklist for Adult Sponsor Form.**

These forms can be found on the Piedmont Region III Science Fair website or on the ISEF website (https://student.societyforscience.org/forms).

All 9th through 12th grade students should plan to accompany their projects Tuesday evening from approximately 6:00pm to 8pm in order to explain their work to the judges. Prior to their interview, students should be in the Readiness Center Lobby rather than roaming the Great Room area. Students are expected to be able to explain their project. Project notebooks should have student's name clearly marked on the front. In cases in which a student has been part of a larger research project, such as some of the Governor's School efforts, the student should be able to explain clearly the larger project, their particular contribution, and how that contribution was important to the larger project. Students and parents are asked to leave once the student has been interviewed and explained their project.

Competition Divisions:

Competition in the Piedmont Region III Science Fair is open to public, private, and home school students in the following South Carolina counties: Cherokee, Chester, Lancaster, Spartanburg, Union, and York.

Divisions are: Elementary (grades 1-4), Middle Level (grades 5-8), and Secondary Level (grades 9-12).

If you are a traditional Elementary School, please enter your 1st through 4th graders as "Elementary", and your 5th graders as "Middle Level". If you are a traditional Junior High School, please enter your 7th and 8th graders as "Middle Level", your 9th graders as "Secondary Level." Typically, an elementary school would submit their

1st and 2nd place winners from the school fair in each of the six categories, for grades 1-4. **Due to space, the total number of projects that you may send forward to the Regional Fair should not exceed 22.**

Scientific Categories:

Complete category and subcategory descriptions can be found here:
http://www.societyforscience.org/isef/project_categories

Behavioral and Social Sciences

Biology, including
Environmental Sciences
Medicine and Health Sciences
Plant Sciences
Microbiology
Animal Sciences
Cellular and Molecular Biology

Chemistry, including
Biochemistry

Computer Science, including
Math

General Science, including
Earth and Planetary Science
Engineering: Electrical and Mechanical
Engineering: Materials and Bioengineering
Environmental Management
Energy and Transportation

Physics, including
Astronomy

Rules, Regulations and Guidelines for All Projects:

ALL PROJECTS, 1st through 12th grades, MUST CONFORM TO ISEF (INTERNATIONAL SCIENCE AND ENGINEERING FAIR) GUIDELINES.

The Society for Science & the Public oversees the Intel International Science and Engineering Fair, with whom we are affiliated.

All rules, regulations, and guidelines can be found on the SS&P-ISEF website:
http://www.societyforscience.org/isef/rulesandguidelines.

Remember, projects at any grade level involving animals or humans must have adult oversight, and if subjects are human minors under 18 years of age, permission of parents must also be obtained. Live animal projects, including behavior-of-pets projects must have adult oversight and must be carried out in a humane fashion. Proper treatment of animals should be documented. **If there is any potential for harm to the researcher or participants, the science fair coordinator at the school must contact Chad Mueller to determine if the project needs to be reviewed by the Scientific Review Committee.**

The necessity of adult oversight (teacher, parent, practicing scientist or engineer) brings up the old problem of separating projects done by adults vs. those done by the student. An adult should review and approve the idea of the project, and serve in a support role keeping an eye on things. If the project is to build a home weather station, then the student needs to build the station by himself. If the project is recording and predicting weather, using the weather station, then parents or others can help in the building, from which the student then takes responsibility for the use of the station. The student could then record weather data, make predictions, and compare their home forecasts with those of the newspaper or TV. Parental help is okay with credit given, and the notebook should have a page plainly stating the role of the associated adults.

Notebooks should be secured-at the Secondary Level as they are essential to further competition. Put your title on the front and name on the back of your notebook. We have had important notebooks disappear during the fair. Either remove your notebooks after judging, or arrange for some means of attaching them to your display board, such as with a length of string. Always keep a backup copy.

Notebooks are not required at the Elementary or Middle Level, but are encouraged.

Projects that involve Human subjects, Animal Subjects, or Potentially Hazardous Materials: **ANY** project that involves human subjects, animal subjects and potentially hazardous material must be first evaluated by the teacher/science fair school coordinator. If there is **any risk** involved with a project it must be approved by the Scientific Review Committee (SRC) before the student starts the experiments. Any questions about these types of projects should be sent to Chad Mueller (cmuelle2@uscupstate.edu). The deadline for submitting a project for review is **December 1st.** The SRC will not review any projects submitted after December 1st. The SRC will relay its decision to the participants within 2 weeks of the proposal submission.

Elementary Projects:

Teachers/Science Fair School Coordinators should evaluate projects to determine if SRC approval is needed.

Middle and High School Projects:

Applicants should include the following in their application package to be submitted by email to Chad Mueller (cmuelle2@uscupstate.edu), Chair of the SRC.

Experiments Using Human Subjects:

Examples of projects that are considered "human participant research" include:

- Participants in physical activities (e.g., physical exertion, ingestion of any substance, any medical procedure)
- Psychological, educational and opinion studies (e.g., surveys, questionnaires, tests)
- Studies in which the researcher is the subject of the research
- Testing of student designed invention, prototype or computer application by human participants other than student researcher
- Data/record review projects that include data that are not de- identified/anonymous (e.g., data set that includes name, birth date, phone number or other identifying variables)
- Behavioral observations that
  o involve any interaction with the observed individual(s) or where the researcher has modified the environment (e.g., post a sign, place an object).
  o occur in non-public or restricted access settings (e.g., day care setting, doctor's office)
  o involve the recording of personally identifiable information.

1) **Examples of Greater than Minimal Physical Risk**
   a. Exercise other than ordinarily encountered in everyday life

      b. Ingestion, tasting, smelling, or application of a substance. However, ingestion or tasting projects that involve commonly available food or drink will be evaluated by the SRC which determines risk level based upon the nature of the study and local norms.

      c. Exposure to any potentially hazardous material.

2) Examples of Greater than Minimal Psychological Risk

A research activity (e.g. survey, questionnaire, viewing of stimuli) or experimental condition that could potentially result in emotional stress. Some examples include: answering questions related to personal experiences such as sexual or physical abuse, divorce, depression, anxiety; answering questions that could result in feelings of depression, anxiety, or low self-esteem; or viewing violent or distressing video images.

The following forms are required:
1. Checklist for Adult Sponsor (1), Student Checklist (1A), Research Plan/ Project Summary, and Approval Form (1B)
2. Risk Assessment (3)
3. Human Participants Form (4) or IRB approval form from an RRI and all applicable consents and survey(s)
4. Regulated Research Institution Form (1C), when applicable
5. Qualified Scientist Form (2), when applicable

Experiments Using Vertebrate Animals:

Vertebrate animals, as covered by these rules, are defined as:
1. Live, nonhuman vertebrate mammalian embryos or fetuses
2. Tadpoles
3. Bird and reptile eggs within three days (72 hours) of hatching
4. All other nonhuman vertebrates (including fish) at hatching or birth.

Exception: Because of their delayed cognitive neural development, zebrafish embryos are not considered vertebrate animals until 7 days (168 hours) post- fertilization.

The following forms are required:
1. Checklist for Adult Sponsor (1), Student Checklist (1A), Research Plan, and Approval Form (1B)
2. Regulated Research Institution Form (1C)
3. Qualified Scientist Form (2)
4. Vertebrate Animal Form (5B)
5. PHBA Risk Assessment Form (6A) –for all studies involving tissues and body fluids.
6. Human and Vertebrate Animal Tissue Form (6B) – for all studies involving tissues and body fluids.

Experiments Using Potentially Hazardous Biological Agents:

The following forms are required:
1. Checklist for Adult Sponsor (1), Student Checklist (1A), Research Plan, and Approval Form (1B)
2. Potentially Hazardous Biological Agents Form (6A) or Human and Vertebrate Animal Tissue Form (6B)
3. Risk Assessment Form (3)
4. Regulated Research Institution Form (1C), when applicable
5. Qualified Scientist Form (2), when applicable

*Prior approval for projects using hazardous chemicals, activities and devices is not required. The student researcher must conduct a risk assessment in collaboration with a Designated Supervisor or Qualified Scientist

prior to experimentation. This risk assessment is documented on the Risk Assessment Form 3. All forms can be found at: http://student.societyforscience.org/forms

2019 Scientific Review Committee:

Chair:	Mr. Chad Mueller Instructor, USC Upstate, College of Science and Technology Division of Natural Sciences & Engineering cmuelle2@uscupstate.edu
Member:	Mr. Jason Lonon Science Teacher, Spartanburg Day School Jason.Lonon@sdsgriffin.org
Member:	Dr. Bradley Baumgarner Assistant Professor, USC Upstate, College of Science and Technology Division of Natural Sciences & Engineering BBAUMGAR@USCUPSTATE.EDU
Member:	Dr. Katharine Welling Veterinarian well74kat@yahoo.com

Project Display:

NO PROJECT DISPLAY MAY CONTAIN ANY OF THE FOLLOWING:
(The Region III Scientific Review Committee is required by ISEF regulations to remove and discard all banned materials. Projects brought to the Regional Fair are screened at the door, and more vigorously screened during the judging.)

1. **NO** live plants, live microbes, or live animals, vertebrate or invertebrate. (Note: the ban applies to DISPLAY of living material. Projects may study any and all of the above, but USE DRAWINGS, MODELS, or PHOTOS to illustrate your project.) For example, one student effectively used paint on Petri dishes to illustrate the microbe abundances he found in his study.

2. **NO** human or animal fluids or body parts, vertebrate or invertebrate, or dried plant material. NO taxidermy mounts. (Exceptions include a well-presented insect, shell, or fossil collection. A dental exhibit or tooth paste project may include sterilized teeth.)

3. **NO FOOD**, human or animal food, open or in sealed packages. (Food projects are fine, but for display use photographs or drawings, or empty boxes, packages, or wrappers. Candy glued to a board must be removed or the project will be rejected at the door.)

4. **NO** drugs of any kind, including non-prescription items like aspirin or tooth paste.

5. **NO** fluids, including water, ink, or dish detergent.

6. **NO** chemicals of any kind (exceptions include minerals or crystals.)

7. **NO** dirt, no soil, no animal or other waste.

8. **NO** photographs or drawings of vertebrate animals in other-than-normal conditions. NO displays showing surgical techniques, dissections or necropsies. (A project investigating why local frogs are dying off is ok, a photographic presentation of your autopsy of a pet turtle is forbidden.)

9. **NO** portrait photographs, or displayed names and addresses. Items which clearly and purposefully identify the contestants are forbidden on the front of the display. However, photographs showing the contestant involved in doing the project are acceptable-faces do not need to be taped over. BUT: PLEASE DO PUT THE NAME OF STUDENT, SCHOOL, AND SCHOOL OR HOME ADDRESS ON THE BACK OF THE PROJECT. These are often important in helping friends, relatives, and others locate a project at the conclusion. Remember, no school logos on the front of the project.

10. **NO** dangerous materials, including weapons, poisons, sharp edges, needles, syringes, pipettes, loose nails or nails sticking out of boards, unshielded live electrical wires, compressed gas tanks, matches, flames, lasers, etc. Bare wire and exposed switches may be used with batteries in circuits of 12 volts or less. All belts and pulleys must be shielded.

11. **NO** Business cards, medals, or awards from previous school fairs.

12. **NO** Product LOGOS or BRAND NAMES. Brands can be differentiated by using "Brand A, B, C..."

13. **ALL LETHAL LIMITS AND CRUELTY PROJECTS ARE BANNED**. A dead cockroach in a 100% dead insect collection is legal; a project which asks what percentage of roaches will die at 20 degrees Centigrade, 30 degrees Centigrade, 40 degrees Centigrade, etc., is a Lethal Limits study, and will not be accepted. A project asking which bait catches which fish should release rather than cook the fish.

14. **NO Liability projects**. An intriguing study asks what percentage of drivers will swerve to run over a rubber snake. Unless you are willing to take legal responsibility for any and all wrecks generated, avoid such studies. Traffic projects in which the student is a passive observer are acceptable, such as "Do drivers speed up at a yellow light?"

15. **No Models of dangerous materials**. In Colorado, police raided a science fair and confiscated an inert bomb. Although technically the project was not immediately dangerous, it was judged inappropriate.

16. NOT BANNED, but a word of caution-be very careful about <u>valuable materials</u> as part of a display. A slide projector, computer, iPad, iPod, or other compact video display may seem like a good supplement for the project presentation. Each year, thousands of people enter and exit the exhibit hall. In the 2007 Fair, an expensive digital picture frame video display disappeared. **<u>WE CAN NOT AND DO NOT ASSUME RESPONSIBILITY FOR THE SAFETY OF SUCH ITEMS</u>**. USE SUCH ITEMS to your advantage in your presentation to the judges Tuesday night (High School Projects), then take them home.

Awards:

<u>Local</u>
Certificates of recognition, prizes and special awards will be offered by a number of organizations such as Converse College, National Audubon Society, Spartanburg Science Center, and the Rotary Club of Downtown Spartanburg.

<u>Additional Awards</u>
In addition to the awards listed above, there will be special awards presented for projects that meet specific criteria. The number and type of special awards vary year by year. A list of special awards presented in the past along with a brief description and link (if available) to the organization's website can be found below.

ASM International Foundation Award: A certificate and medallion will be awarded to the most outstanding exhibit in materials science and engineering. The winning project will need to use materials-related concepts, demonstrate some aspect of the materials paradigm, be clear in presentation, and demonstrate a clear understanding of the scientific method.

Association of Women Geoscientists Award: Certificates, cash ($30-$100), and a science-related gift will be awarded to female students whose projects exemplify high standards of innovativeness and scientific excellence in the geosciences.

Intel Excellence in Computer Science Award: Best senior high project related to computer science (not math project).

In vitro award: A certificate will be awarded to the most outstanding 11th grade student exhibiting in the areas of plant or animal in vitro biology or tissue culture.

Mu Alpha Theta: A certificate will be awarded to the project demonstrating the most challenging, original, thorough, and creative investigation of a problem involving mathematics accessible to a high school student.

NOAA Award: A certificate, letter, and medallion will be awarded to a project whose research emphasizes NOAA's mission: to understand and predict changes in Earth's environment and to conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs.

Ricoh Corporation Award: A certificate will be awarded to an individual or team whose principles and technical innovations offer the greatest potential for increasing our ability to grow environmentally friendly and socially responsible businesses.

US Metric System Award: A certificate will be awarded to the project that involves quantitative measures and which best uses the SI metric system for those measures.

US Stockholm Junior Water Prize Regional Award: Prize for environmentally-related projects.
Water Environment Association of South Carolina: Best water-related project (particularly if it involved the environment).

Yale Science and Engineering Association Award: The YSEA Award is given to an 11th grade student for the most outstanding exhibit at a state or regional high school Science Fair in Computer Science, Engineering, Physics, or Chemistry.

Broadcom MASTERS: A certificate and invitation to enter the Broadcom MASTERS national competition will be awarded to students in grades 6-8 for mastery of S.T.E.M. principles. All applicable forms must be filled out to compete in the competition.

Science Fair Registration Information:

1) School coordinators are asked to email me at sciencefair@uscupstate.edu between now and January 11, 2019 in order to indicate their school's participation in the Piedmont Region III Science Fair. Please include your complete **contact information**, and the **number of projects you anticipate** sending to the fair.

2) Coordinators will be given instructions in February on how to register their school's projects between February 26th and March 1st. PLEASE NOTE: Coordinators must register individual student winners and their projects for participation in the Piedmont Region III Fair in advance of the fair.

Thank you for your service as Science Fair Coordinator. Please let me know if I can be of further assistance.

Sincerely,

Dr. Stephen Bismarck

Director, Piedmont Region III Science Fair
Interim Chair for the Department of Education
Associate Professor of Middle/Secondary Mathematics Education

USC Upstate, School of Education, Human Performance, and Health
800 University Way
Spartanburg, SC 29303
Office: 864-503-7407
Fax: 864-503-5574
sciencefair@uscupstate.edu

Sample scorecards can be found on the next two pages of this document

Piedmont Region III Science Fair Judges' Score Card

Elementary and Middle School Projects

					⟵——————— Project numbers
					1. Scientific Thought – The Problem (10 Points) Is the project title in question format or imply a question to be answered? Is the problem/purpose clearly and concisely stated? Is there a comprehensive review of related research included? Is the hypothesis based upon the review of related research and stated in "If…then" format?
					2. Scientific Thought – The Design (10 Points) Are the procedures listed, appropriate, logical, organized, and thorough? Are the materials appropriate and listed in a way that the project can be replicated? Do the project procedures demonstrate a long-term commitment by using multiple trials? Does the project use and identify the manipulating/responding and/or dependent/independent variables correctly? Does the project specify the control and experimental groups used?
					3. Scientific Thought – The Results (10 Points) Does the project show the results of multiple trials? (3 or more) Are the results accurate and complete? Are the data tables and graphs accurately identified and labeled? If needed, are the results of individual trials and averages included? Is an interpretation of the tables and graphs included? Is there a discussion/summary of the results? Does the project show considerable time commitment in the objective analysis of the results?
					4. Scientific Thought – The Conclusions (10 Points) Are the conclusions based upon the stated hypothesis and results? Does the project show considerable time commitment in the interpretive analysis of the results? Do the conclusions address the following: The status of the hypothesis after the study. Practical applications. What was learned? How the present study relates to earlier studies cited in the review of related research? Sources of error and limitations. Suggestions for improvement. Suggestions for future studies.
					5. Scientific Thought – The Concepts, Ideas, and Principles (10 Points) Are the scientific concepts, ideas, and principles clearly developed, explained and used correctly? Are the scientific concepts, ideas, and principles appropriate for the student's grade level?
					6. Acknowledgements/References (10 Points) Does the student clearly show use of related research and prior studies? Is a bibliography of necessary references listed and available? Has the student acknowledged help they received from others? Are acknowledgements clearly stated?
					7. Creative Ability (10 Points) Does the project show original thinking or a unique approach? Does it demonstrate ideas arrived at by the student?
					8. Thoroughness & Clarity (10 Points) Does the project tell a complete story? Does it explain what the student did and learned? Does the project show considerable time commitment overall? Are all parts of the project presented in a logical order? (Top middle – Title; from left to right - purpose, review of related research, hypothesis, procedures, materials, results, discussion of results, conclusions, and acknowledgements/bibliography).
					9. Dramatic Value (10 Points) Are all parts of the project attractive and neatly done? Is the font size and style easy to read? Does it catch your attention? Do you really want to look at the project further? Are illustrations and/or photographs used appropriately? Is proper emphasis given to the most important ideas?
					10. Technical Skill (10 Points) Does the project show good craftsmanship by the student? (Legibility, Layout, etc.) Is the written and presented material both organized and accurate? Has the student used correct grammar and punctuation? Have computer-generated text, graphs, tables, illustrations been used correctly?
					Totals (out of 100)

Intel ISEF Judging Guidelines For Senior High Projects

Project numbers:					
I. Research Question (10 pts)					
Clear and focused purpose					
Identifies contribution to field of study					
Testable using scientific methods					
II. Design and Methodology (15 pts)					
Well-designed plan and data collection methods					
Variables and controls defined, appropriate and complete					
III. Execution: Data Collection, Analysis and Interpretation (20 pts)					
Systematic data collection and analysis					
Reproducibility of results					
Appropriate application of mathematical and statistical methods					
Sufficient data collected to support interpretation and conclusions					
IV. Creativity (20 pts)					
Project demonstrates significant creativity in one or more of the above criteria					
V. Presentation (35 pts)					
a. Poster (10 pts)					
Logical organization of material					
Clarity of graphics and legends					
Supporting documentation displayed					
b. Interview (25 pts)					
Clear, concise, thoughtful responses to questions					
Understanding of basic science relevant to project					
Understanding interpretation and limitations of results and conclusions					
Degree of independence in conducting project					
Recognition of potential impact in science, society and/or economics					
Quality of ideas for further research					
For team projects, contributions to and understanding of project by all members					
Totals: (out of 100 total points)					