RULES

****These rules represent regional as well as SAA science fair requirements. They can be found in their entirety on the website:
http://community.weber.edu/sciencefair/
If there are any questions contact your child's teacher.

Size Restrictions

Maximum height of the exhibit is **198 cm (78 in).** This does *not* include the height of the table. Tables will be provided and all exhibits must be placed on a table. The overall height of the display including table should not exceed **272 centimeters (108 inches).** Displays may not be more than **76 cm (30 in)** deep, front to back; and **122 cm (48 in)** wide, side to side. There will be no exceptions.

Unacceptable For Display

1. Living Organisms, including plants.
2. Taxidermy specimens or parts.
3. Preserved vertebrate or invertebrate animals
4. Human or animal food. Human/animal parts or body fluids. Plant materials (living, dead, or preserved) which are in their raw, unprocessed, or non-manufactured state.
5. Laboratory/household chemicals including water.
6. Poisons, drugs, controlled substances, hazardous substances or devices (for example, firearms, weapon, ammunition, reloading devices).
7. Dry ice or other sublimating solids.
8. Sharp items (for example, syringes, needles, pipettes, knives)
9. Flames or highly flammable materials.
10. Batteries with open-top cells.
11. Awards, medals, business cards, flags, acknowledgements, etc.
12. Photographs or other visual presentations depicting vertebrate animals in surgical techniques, dissections, necropsies, or other lab procedures.
13. Active Internet or e-mail connections as part of displaying or operating the project at the Intel ISEF.

Human Subjects:

See http://www.hhs.gov/ohrp/for federal rules on research on humans.

Studies involving exercise or ingestion where the researcher determines the methodology require review to assure that activities/materials do not cause risk to participants (e.g., exercise in those with cardiac or other health problems, ingestion of large quantities of sugar, pop, etc). ANY such project on minors must have informed consent forms (available in Science Fair rulebook or soon on website).

Any projects involving invasive surveys (on sex, AIDS, divorce, etc) or on vulnerable groups (pregnant women, diabetics, asthmatics, etc) require informed consent of adults and minors.

Nonhuman Vertebrate Animals: see above website and http://www.aphis.usda.gov/ac/ for info on the Animal Welfare Act and the Guidelines on the Use and Care of Laboratory Animals.

Research on small rodents cannot be carried out in the students home because housing conditions there do not meet the standards of the Animal Welfare Act (see website above).

Exposing animals to needless pain, acids, pesticides, heavy metals, petroleum products etc is prohibited.

Studies with ≥ 50% mortality (accidentally or on purpose), or weight loss ≥ 15% must be disqualified.

Pathogens (including all microbes except Brewer's yeast and E. coli strain K12):

Standards for Safety in Microbiological Laboratories are available at http://www.cdc.gov/od/ohs/biosfty/biosfty.htm

Pathogens cannot be cultured at home (though they can be collected there). This is a big no-no as these organisms are potentially harmful, particularly the ubiquitous studies of anti-bacterial products. These projects are in reality evolutionary selection for drug resistant strains. As you know, outbreaks of deadly *Escherichia coli*, *Salmonella* etc from home environments (especially food) are increasing and it is only a matter of time before a student isolates a nasty strain. The above website lists the safety precautions required to work with specific microbe species. Most household strains require Bio-safety level 2 precautions (where Bio-safety level 4 requires the safety suits of *The Hot Zone* and *Outbreak* fame) that can be met in a classroom but not at home.

Culture plates cannot be displayed in projects, they may contain harmful microorganisms.

Animal Tissue (including human):

Research on blood requires certification that it is free of HIV and hepatitis B and C, or OSHA standards for blood borne pathogens are met (OSHA 29CFR Subpart Z 1910.1030).

Chemicals: Free access to MSDS's at http://www.msdsonline.com or http://www.sigma.com

Chemicals must be handled and disposed of in accordance with the information on the Material Safety and Data Sheet (MSDS). Chemicals should not be displayed in projects.

Human Subjects:

Research on human subjects is governed by a number of federal regulations including:

(1) CFR Title 45 (Public Welfare) Part 46 - Protection of Human Subjects

(2) CFR Title 45 (Public Welfare) Part 5b - Privacy Act Regulations

(3) Public Health Service Act 42 U.S.C. S241 (d) - Protection of Privacy of Research Subjects

See the U. S. Office of Protection From Research Risks website (http://www.nih.gov/grants/oprr/oprr.htm) for access to these documents and good resources and links on human subjects and animal research regulations, protocols and alternatives.

The main goal of these regulations is to insure that human research subjects are fully informed of the risks of being involved in research projects and that legally vulnerable groups (minors, pregnant women, diabetics, asthmatics, etc) are not taken advantage of during the process of research on causes or solutions to medical problems. Projects on humans that involve anything more than observation of natural undisturbed behavior require review by people not directly participating in the research to assure that undue risks are not taken, or if risks are involved, that the research subjects are fully informed about the risks and have given consent to the procedures knowing the risk (known as informed consent).

Informed consent is required for all minors and for adults when more than minimal risk is involved in participating in the project. The federal government defines minimal risk as existing "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."

Studies involving exercise or ingestion where the researcher determines the methodology involve more than minimal risk to participants and ANY such

projects must have informed consent forms signed by participants before study begins (available in Science Fair rulebook or soon on website*****).

Other web resources:

Standards for Educational and Psychological Testing: http://www.apa.org/science/testing.html

Nonhuman Vertebrate Animals:

Research on nonhuman vertebrates is governed by a number of federal regulations including:

(1) 7 U.S.C. 2131-2157- Animal Welfare Act

The main goal of this law is to ensure that animals involved in research, commercial breeding, zoos, etc are housed, transported, cared for, and euthanised in a responsible way that causes minimum pain or discomfort for the animals. Retail pet shops are not covered under the Act unless they sell to zoos or research facilities. Animal shelters and pounds are only covered under the Act if they sell to commercial dealers. Privately owned pets are also not covered. The Act only covers "warm-blooded animals" with the exception of farm animals and some research animals (e.g., laboratory mice strains are not covered). The Act also requires that research on animals not unnecessarily duplicate previously completed research and that researchers consider and use alternative research methods (tissue studies instead of whole animals, plants, fungi or prokaryotes instead of animals, mathematical or computer modeling, etc).

See the U. S. National Institutes of Health, Office of Protection From Research Risks website

(http://www.nih.gov/grants/oprr/oprr.htm), or the U. S. Department of Agriculture, Animal Plant Health Inspection Service website (

http://www.aphis.usda.gov/ac/) for access to resources and links on the Animal Welfare Act and specific animal research regulations, protocols and alternatives. The USDA site has a good history of the Animal Welfare Act and descriptions of the standards for behavioral enrichment requirements that were just updated for primates in zoos and labs. A publication called Guidelines on the Use and Care of Laboratory Animals is available from

http://www.nap.edu/readingroom/books/labrats/

. The American Dairy Science Association also publishes a Guide for the Care and Use of Agricultural Animals in Research and Teaching at http://www.adsa.uiuc.edu.

For science fair these rules mean that:

Research on small rodents cannot be carried out in the students home because housing conditions there do not meet the standards of the Animal Welfare Act (see above).

Exposing animals to needless pain, acids, pesticides, heavy metals, petroleum products etc is prohibited.

Studies with ≥ 50% mortality (accidentally or on purpose), or weight loss ≥ 15% must be disqualified.

Pathogens (including bacteria, viruses, fungi, parasites, viroids, prions):

Research on potential pathogens is governed by standards established by the U.S. Centers for Disease Control and the National Institutes of Health. These organizations publish the manual *Biosafety in Microbiological and Biomedical Laboratories* which is the standards for containment and safe handling of these organisms. This manual categorizes organisms into one of 4 levels of risk (Biosafety risk level 4 requires the safety suits of *The Hot Zone* and *Outbreak* fame to protect against ebola, small pox, and other very risky microbes). The safety precautions and equipment required to work with specific microbe species is listed in appendices to the manual. The manual can be found on the CDC's Office of Health and Safety website at http://www.cdc.gov/od/ohs/biosfty/biosfty.htm.

For science fair, all microbes except Brewer's yeast and *E. coli* strain K12 are to be considered potentially pathogenic and the standards above must be

followed when working with microbes. In particular, this means bacteria cannot be cultured at home (though they can be collected there). This is a big no-no as these organisms are potentially harmful, particularly the ubiquitous studies of anti-bacterial products. These projects are in reality evolutionary selection for drug resistant strains. As you know, outbreaks of deadly *Escherichia coli, Salmonella* etc from home environments (especially food) are increasing and it is only a matter of time before a student isolates a nasty strain. Most household strains require Biosafety level 2 precautions (see above website) that can be met in a classroom but not at home.

Culture plates cannot be displayed in science fair projects, since they may contain harmful microorganisms.

Other web resources:

Bergey's Manual of Systematic Bacteriology:
http://www.cme.msu.edu/bergeys/bmsb.html

Animal Tissue (including human):

Research on blood that is not the researcher's own requires certification that it is free of HIV and hepatitis B and C, or OSHA standards for blood borne pathogens are met (OSHA 29CFR Subpart Z 1910.1030). See The U.S. Occupational Safety and Health Administration Standards at http://www.osha-slc.gov/OshStd_data/1910_1030.html

Chemicals and Controlled Substances

Students should be aware that the Occupational Safety and Health Administration requires workplaces, including laboratories, to maintain Material Safety Data Sheets (MSDS 's) on all chemicals used or stored at the facility. In addition, the rules for handling, storage and disposal of these chemicals that can be found in the MSDS's must be followed. Free access to MSDS's can be found at many sites including:

http://www.msdsonline.com or http://www.sigma.com.

Chemicals used in science fair projects should not be displayed in projects at the fair.

Students involved in projects using controlled substances, including U. S. Drug Enforcement Agency classed substances (many opiates, hallucinogens, stimulants, depressants, narcotics) must acquire and use these chemicals according to local, state, and federal laws. The U.S. Drug Enforcement Agency website has a link to the list of DEA controlled substances at http://www.usdoj.gov/dea/pubs/pblist.htm.

Other web resources:

Radioactive substances: http://www.fda.gov, http://www.nrc.gov