

NWSES Super EZ Rules for Middle School Projects

Microbe Cultures

The following three microbes are approved without special precautions:

- Baker's yeast purchased from a store
- Brewer's yeast purchased from a store
- Yogurt cultures

A risk assessment needs to be included in the project procedures answering the following for all other microbe projects:

1. List the type of microbe that will be used.
2. Identify the risks involved.
3. Describe the safety precautions used to reduce risk.
4. Describe the disposal methods used.

The following microbe projects can only be conducted at school or a research lab:

I. **Unknowns** obtained from the environment must be treated as follows:

Studies involving unknown microorganisms present a challenge because the presence, concentration and pathogenicity of possible agents are unknown. In science fair projects these studies typically involve the collection and culturing of microorganisms from the environment (e.g. soil, household surfaces, skin, etc.)

1) Research with unknown microorganisms can be treated as a BSL-1 study under the following conditions:

- a) Organism **is cultured** in a plastic Petri dish (or other standard non-breakable container) **and sealed**. Other acceptable containment includes petro film and doubled heavy-duty (2-ply) sealed bags.
- b) Experiment involves only procedures in which the Petri dish remains sealed throughout the experiment (i.e. counting presence of organisms or colonies).
- c) The sealed Petri dish is disposed of in the appropriate manner under the supervision of the teacher or Designated Supervisor.

Not Allowed: opening a culture for identification, sub-culturing or isolation.

II. Bio Safety Level 1 microbes specifically listed below may be used as long as all BSL-1 containment precautions are followed.

BSL-1 risk group contains biological agents that pose low risk to personnel and the environment. These agents are highly unlikely to cause disease in healthy laboratory workers, animals or plants. The agents require BioSafety Level 1 containment. Approved BSL-1 organisms are: *Aspergillus niger*, *Bacillus thuringiensis*, *Escherichia coli strain K12*, *Lactobacillus acidophilus*, *Micrococcus leuteus*, *Neurospora crassa*, *Pseudomonas fluorescens*, and *Serratia marcescens*.

BSL-1 containment is normally found in water-testing laboratories, in high schools, and in colleges teaching introductory microbiology classes. Work is done on an open bench or in a fume hood. Standard microbiological practices are used when working in the laboratory. Decontamination can be achieved by treating with chemical disinfectants or by steam autoclaving. Lab coats are required and gloves recommended. The laboratory work is supervised by an individual with general training in microbiology or a related science.

Microbe rules come directly from the Intel ISEF rulebook.

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Vertebrate Animals

Two types of Vertebrate animal projects are allowed using the MS Super EZ form.

1. Observational studies of behavior of animals in their habitat (this includes the home for pets, the zoo, and nature) where there is NO intervention or treatment. (**OK:** a student observes goldfish behavior during feeding time vs. non-feeding times on a normal feeding schedule. **Not allowed:** a student observes how the goldfish react to not being fed on a normal feeding schedule.)
2. Behavioral projects for pets involving doing things that pets experience in everyday life i.e. a new food dish, supplemental treats (following label recommendations), a new toy. (**OK:** a student observes which colored dish a dog prefers to drink from. **Not allowed:** adding food coloring to water to see which color the dog prefers.)

Pets are defined as animals not acquired specifically for a research project.

Human and Vertebrate Animal Tissue

The following human and animal tissues are allowed using the MS Super EZ form.

- The researcher's *own* nail clippings
- Hair
- Sterilized teeth
- Meat or meat by-products obtained from a food store, with receipt
- Fossils
- Prepared fixed tissue slides

(**OK:** a student compares strength and texture of clippings of her own hair after it is soaked in different concentrations of salt solution. **Not allowed:** a student compares shape and size of teeth from a variety of 'road-kill' animals.)

Not Allowed

ALL other projects involving human and animal tissue, including those involving organs, non-sterilized teeth, blood and other body fluids.

Deadlines & Fees for Intel NWSE

January 10, 2008	Deadline for 8 th graders to petition for non-EZ projects.
January 30, 2008	Projects submitted & postmarked by this date pay \$5.
February 6, 2008	Projects submitted & postmarked by this date pay \$10.
February 13, 2008	Projects submitted & postmarked by this date pay \$15. Final day to submit projects.
March 3, 2008	Last day to edit project summaries and categories.
March 13, 2008	Exhibit set-up at Peter Stott Center for Intel NWSE.
March 14, 2008	Intel NWSE judging and award ceremony.

Regional Fairs have varying deadlines, refer to www.nwse.org

Intel Northwest Science Expo Middle School Categories

Behavioral and Social Sciences: Human and animal behavior, social and community relationships- psychology, sociology, anthropology, archaeology, linguistics, learning, perception, urban problems, public opinion surveys, etc.

Botany: Plant Sciences, Cellular and Molecular Biology

Chemistry and Earth: Study of nature and composition of matter and laws governing it- physical chemistry, organic chemistry, inorganic chemistry, plastics, metallurgy, soil chemistry, etc. Geology, mineralogy, climatology, oceanography, meteorology, seismology, geography, tectonics, planetary science, etc

Computer Science and Math: Study and development of computer software and hardware and associated logical devices. Development of formal logical systems or various numerical and algebraic computations, and the application of these principles- calculus, geometry, abstract algebra, number theory, statistics, complex analysis, probability.

Consumer Products Testing: Comparison of product quality, effectiveness, usefulness, economy, cost, smell, environmental friendliness, etc.

Engineering: Technology; projects that directly apply scientific principles to manufacturing and practical uses- civil, mechanical, chemical, electrical, material, thermodynamics, robotics etc.

Energy and Transportation: Aerospace and aeronautical engineering, aerodynamics, alternative fuels, fossil fuel energy, vehicle development, renewable energies, engines

Environmental Science: Study of pollution (air, water, and land) sources and their control; environmental engineering, ecology.

Medicine and Health: Study of diseases and health of humans and animals- dentistry, pharmacology, pathology, ophthalmology, nutrition, sanitation, pediatrics, dermatology, allergies, speech and hearing, etc.

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

Zoology: Animal Sciences and Microbiology

↳ Large team projects will compete against individual and small team projects in the appropriate project category. A student may only have one project.

Selecting a category

The key for selecting your exhibit's category is the dependent variable (the thing that is being affected). For example, if a student examined the effects of the composition of the soil on plant growth, the dependent variable would be the height of the plant, since that is what the student is trying to measure change in. Since the dependent variable is the plant growth, this project would be under the category of Botany. However, if a student examined how plant growth changes the composition of the soil, then the dependent variable is the composition of the soil, and so his project would be under Chemistry and Earth. The only exception to this rule is when Consumer Products Testing is involved. For example, if a student tests different brands of similarly concentrated Orange Juice for amounts of Vitamin C, her project should be in Consumer Products Testing since it compares different brands. The key to this exception is that different brands of similar products are incorporated into the independent variable.