

FIRST ANNUAL KODIAK ISLAND AMERICAN
INDIAN SCIENCE
& ENGINEERING SOCIETY

SCIENCE FAIR 98
HANDBOOK

November 18–20 1998

at the

Old Harbor School

Old Harbor, Alaska

Lodging: Old Harbor School Classrooms

For more information contact:

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Teachers and Students:

We would like to invite you and your students to the First Annual Kodiak Island AISES Science Fair 98. The fair will be held in the commons of the school, at Old Harbor, Alaska. Students will set up their projects anytime between 8 AM and 5 PM., November 18, 1998. Preregistration deadline is Wednesday, November 11. The opening ceremony is at 6:00 PM, Wednesday, November 18, 1998.

Any student of the Kodiak Island Borough in grades K–12 is eligible to participate in the First Annual Kodiak Island AISES Science Fair (none of whom has reached age 21 on or before November 1 preceding the fair). All students K–4 are invited to send in their project for display on November 18. Students are invited to wear traditional dress at the fair and at the awards dinner.

All Grades: Projects must adhere to display and safety regulations (see pages 4 & 5)
Grades 9–12 Every student in grades 9–12 must submit a copy of their research plan with their registration form.

Grades K-12 Fill out and sign the registration form.

Students can select a project in any one of the 12 categories listed on pages 11–12. There will be 1st, 2nd, and 3rd place awards in each of these categories. Elders will be selecting their own categories and will select 1st, 2nd, and 3rd place winners. All students will receive a participation certificate. In addition, the overall top 4 projects will win an expense paid trip to Albuquerque, New Mexico on March 5–6, 1999 where they will enter their project in the AISES National Annual Science Fair or Alaska State Fair, March 18-20, 1999.

All registration forms and research plans will be reviewed by a committee with teacher, scientists, and elders associated with the Alaska Native Knowledge Network. We will contact you if there is any problem or question about your project.

Participants and chaperones are responsible for their own travel and meals while at the science fair. Students must bring a sleeping bag as they will sleep in the Old Harbor School classrooms with chaperones. Teri Schneider can assist you with air travel arrangements. Please contact her at 486-9031.

Please read the enclosed information and guidelines carefully. We look forward to seeing you in Old Harbor.

TENTATIVE AGENDA

November 18–November 20, 1998

LOCATION: All activities will take place at the Old Harbor School.

WEDNESDAY, NOVEMBER 18

Noon–5:00 PM	PARTICIPANT CHECK-IN
NOON-5:00 PM	PROJECT SET-UP
5:00-6:30 PM	PARTICIPANT DINNER
6 :30–7:30 PM	Opening ceremony with Alutiiq dance
7: 30–8:30 PM	Science fair committee walk through of exhibits

THURSDAY, NOVEMBER 19

8 AM-9 AM	Judges' briefing
9:30 AM–1 PM	Grades 9–12 judging with student participants only
9:30 AM–1 PM	Grades 5–8 tours of community
1 PM–2 PM	Lunch break
2 PM–5 PM	K–8 judging with student participants only.
2 PM–5 PM	9–12 tours of community
6 PM–8 PM	Potluck Dinner & Awards Ceremony
8 PM–10 PM	Participants take down projects

FRIDAY, NOVEMBER 20

8 AM BREAKFAST / TRAVEL HOME

AWARDS CEREMONY

Thursday Evening of November 19, 1998

Potluck Dinner and Awards

DEADLINE

Registration form and research paper (if required) must be postmarked, November 11, 1998.

ELIGIBILITY REQUIREMENTS

K-12 students in the Kodiak Island Borough school district.

Kodiak Island Borough School District students not attending may send in projects via mail or a chaperone.

DISPLAY AND SAFETY REGULATIONS

UNACCEPTABLE FOR DISPLAY

1. Living organisms (we recommend photographs or drawings in place of living organisms)
2. Preserved vertebrate or invertebrate animals (includes embryos)
3. Soil or waste samples
4. Sharp stems (i.e., syringes, needles, pipettes)
5. Flammable or hazardous chemicals
6. Poisons, drugs, controlled substances
7. Dry ice
8. Flames or highly flammable display materials
9. Tanks that have contained combustible liquids or gases, unless purged with carbon dioxide
10. Batteries with open top cells
11. Awards, medals, business cards, flags, etc.
12. Hand-outs to judges must be limited to one page narratives related to the essentials of this year's project. Personal accomplishments, acknowledgments, addresses, phone and fax numbers are not permitted

ACCEPTABLE FOR DISPLAY ONLY (CANNOT BE OPERATED)

1. Projects with unshielded belts, pulleys, chains, and moving parts with tension or pinch points
2. Class III and IV lasers
3. Any device requiring over 110 volts

ACCEPTABLE FOR DISPLAY & OPERATION WITH RESTRICTIONS

1. Class II lasers:

- a. must be student operated
 - b. posted sign must read "Laser radiation: Do Not Stare into Beam" (AISES will provide sign if needed)
 - c. must have protective housing that prevents access to beam
 - d. must be disconnected when not operating.
2. Large vacuum tubes or dangerous ray-generating devices must be shielded properly.
 3. Pressurized tanks that contained non-combustibles may be allowed if secured.
 4. Any apparatus producing temperatures that will cause physical burns must be adequately insulated.
 5. High-voltage equipment must be shielded with a grounded metal box or cage to prevent accidental contact.
 6. High-voltage wiring, switches, and metal parts must have adequate insulation and overload safety factor, and must be inaccessible to others.
 7. Electric circuits for 110-volt AC must have a nine foot (min.) cord. The cord must have sufficient load-carrying capacity and be approved by Underwriters Laboratories
 8. Electrical connections in 110-volt AC circuits must be soldered or made with approved connectors. Connecting wires must be insulated. Greater than 110 volts not permitted.
 9. Bare wire and exposed knife switches may be used only in circuits of 12 volts or less; otherwise, standard enclosed switches are required.

SIZE OF PROJECT SPACE

Project space is limited to:

76 cm (30 in) deep

122 cm (48 in) wide

274 cm (108 in) high, including table

Any exhibit exceeding these dimensions may be eliminated.

Exhibits may be smaller.

CRITICAL SCIENCE FAIR DATES

NOVEMBER 11

Registration forms and abstract (if required) need to be postmarked on or prior to November 11.

NOVEMBER 18

Noon to 5 PM participant check-in/ set-up

5-6:30 Participant Dinner

6:30 PM–8:30 PM Opening ceremony and traditional dancing

NOVEMBER 19

Science fair judging. All students, must be present at their own exhibit for questioning by the judges.

Grades 9–12 only in the morning

Grades K–8 only in the afternoon

Dinner and awards ceremony

November 20

Breakfast

Travel Home

LIMITATIONS

Each student may enter only one project.

Team projects may have a maximum of three members.

Science fair exhibits must adhere to science fair safety and size requirements (see display and safety regulations).

REQUIREMENTS

Every 9–12 grade student must complete the research plan and registration forms.

Each student or team in grades 9 through 12 must submit a (maximum) 250-word, one page abstract, which summarizes this year's work. The abstract must describe research conducted by the student or team, NOT by adult supervisors.

Each student or team in grades 9 through 12 should display a project data book (page 10). The abstract must be included in the data book.

Each student must have a teacher, an expert (could be scientist) in the field, and an elder review his/her project, fill out the Alutiiq Cultural Values Checklist, and sign it. These checklist should be included in the data book with the display.

JUDGING

There will be two sets of judges:

A. Elders of the Alutiiq region

Elders will review the projects for their alignment with Alutiiq values and for their contribution to the students' village community.

1. How well did the student maintain Alutiiq values? (see list of values)

a. Alutiiq values (20 points)

- b. Presentation to judges (10 points)
 2. Is the project meaningful to Alutiiq culture? (10 points)
 3. Is the project meaningful to village/ community life? (10 points)
 4. Is the project meaningful to the physical environment of the community, including land and assets of the local Native corporations and Tribes?
- B. Teachers/scientists
- Teacher/scientists will evaluate
1. How well a student followed the scientific method?
 - a. Creative ability (10 points)
 - b. Scientific thought/engineering goals (10 points)
 2. Detail and accuracy of research notebook and /or procedure
 - a. Thoroughness (10 points)
 - b. Presentation to judges (10 points)
 3. If food/equipment were used in the best possible way.
 - a. Skill (10 points)
 - b. Teamwork (for team projects only) (10 points)

Overall, judges will look for well thought-out research. They will look at how significant your project is in its field and to the village community. They will look for thoroughness. Did you leave something out?

Judges will applaud students who can speak freely and confidently about their research. They are not interested in memorized speeches—they simply want to TALK with you about your research to see if you have a good grasp of your project from start to finish. Besides asking the obvious questions, judges often ask questions outside the normal scope to test your insight into research such as “Why did you pick this project?” and “What would be your next step?”

TEAM PROJECTS

Team projects compete against each other in two subcategories—life sciences and physical sciences. Life sciences include behavioral and social sciences, microbiology, zoology, botany, biochemistry ecology, medicine, and health. Physical sciences include chemistry (physical), engineering, computer science, mathematics, earth and space sciences, environmental sciences, and physics.

Each team may have a maximum of three members. All members must be from the same school.

Each member of the team should be able to serve as spokesperson, be fully involved with the project, and be familiar with all aspects of the project. If all members are not in attendance at the Fair in Old Harbor, then a paper should be available which supports each team member’s involvement with the project. This paper should be included in the data book. A new member may not be added to a continuing team project.

The final work should reflect the coordinated efforts of all team members and will be evaluated using the same rules and similar judging criteria as the other content categories. The team jointly submits one abstract and one research plan (in the registration form) that outlines each person’s tasks. Names of all team members must appear on the abstract and forms. A copy of the abstract and research plan should appear in the data book with the project.

WHO'S INVOLVED IN A SCIENCE PROJECT?

THE ADULT SPONSOR

An adult sponsor may be a teacher, parent, university professor, or scientist with whom the student is working. This individual should have close contact with the student during the course of the project.

The adult sponsor is ultimately responsible not only for the health and safety of the student conducting the research, but also for the humans or animals used as subjects. The adult sponsor must review the student's research plan to make sure that a) experimentation is done maintaining the Alutiiq values and b) that forms are completed by other adults involved in approving this experiment: the adult sponsor, a science teacher or expert in the field, and an elder in the community.

The adult sponsor must be familiar with the regulations that govern potentially dangerous research as they apply to a specific student project. These may include chemical and equipment usage, experimental techniques, research involving human or nonhuman animals, and cell cultures, microorganisms, or animal tissues. The issues must be discussed with the student when drafting the research plan. Some experiments, involve procedures or materials that are regulated by state and federal laws. If not thoroughly familiar with the regulations, the adult sponsor should help the student enlist the aid of a qualified scientist.

The adult sponsor is responsible for making the student's research eligible for entry in First Annual Kodiak Island AISES Science Fair and also if awarded the opportunity to enter the National AISES Science Fair or Alaska State Fair.

PROJECT REVIEW COMMITTEE

All projects must be reviewed by three individuals: the adult sponsor, a teacher or expert in the field, and an elder in the community. Each committee member must fill out and sign the Alutiiq Values Checklist.

If the project is behavioral, a psychologist, counselor or individual with human behavioral training must serve on the project review committee.

If the student is using human subjects under 18, the student researchers must obtain written informed consent from all subjects and their parent or guardian. Consent forms should be included in the project's data book.

A fourth member should always be available to substitute on the student's project review committee, if needed.

None of the student's project review committee members may serve on the Kodiak Island AISES Science Review Committee. This eliminates conflict of interest.

KODIAK ISLAND AISES SCIENCE REVIEW COMMITTEE

Claudette Bradley-Kawagley, (907) 474-5376

Teri Schneider, (907) 486-9031

Alan Dick, (907) 524-3782

Larry Duffy, (907) 474-7029

Oscar Kawagley, (907) 474-5403

Olga Pestrikoff (907) 286-2213

The Kodiak Island AISES Science Review Committee examines projects prior to judging and during the week of November 11–November 18. The committee will look for:

1. The abstract
2. Type and amount of supervision
3. Use of accepted research techniques
4. Completed forms and signatures
5. Humane treatment of animals
6. Compliance with Alutiiq Values
7. Appropriate use of DNA, pathogenic organisms, and controlled substances (when or if applies)

COMMITTEE SCHEDULE:

1. Before November 18 the science review committee will review and approve experimental procedures of projects involving human subjects, nonhuman vertebrates, pathogenic agents, controlled substances, DNA and human/animal tissue to make sure they comply with the Alutiiq values (page 14) and scientific method (page 19).
2. On November 18 the science review committee will review the project displays of the same projects to make sure the students followed their research plan and the Alutiiq values.
3. Projects which do not comply with their research plans and Alutiiq values will be eliminated.

A TOP-NOTCH SCIENCE PROJECT SHOULD INCLUDE:

PROJECT DATA BOOK

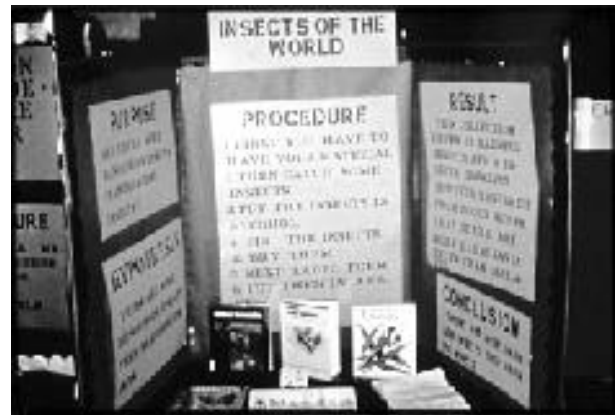
A project data book is a most critical piece of work. Good notes show consistency and thoroughness to the judges and help when writing the abstract. **REMINDER:** This is checked by the science review committee and judges.

Include your abstract, copies of consent forms (if needed), copies of the Alutiiq checklist with signatures, and data sheets/notes for collection of data.

VISUAL DISPLAY

You want to attract and inform. Make it easy for interested spectators and judges to assess your study and the results you obtained. Make the most of your space using clear and concise displays. Make headings stand out, draw graphs, and diagrams clearly and label them correctly. You would be surprised how often visuals are mislabeled so pay careful attention.

Use a display board that stands alone with three panels. Clearly label your title, statement of purpose or hypothesis, materials used, procedure, results, and conclusion. Use models, photographs, or drawings if appropriate. Make your display board logically presented, easy to read, and eye-catching. Be sure to adhere to the size limitations and safety rules when displaying your project. Do not hesitate to ask for advise from adults if you need it. Remind your sponsor to check the display rules.



STEP BY STEP GUIDELINES FOR SCIENCE FAIR PROJECTS

Follow the guidelines of the Step by Step Guidelines written by Milwaukee Indian Center. They are thorough guidelines and will help you:

1. Pick your topic.
2. Research your topic
3. Organize and theorize
4. Make a timetable
5. Plan your experiment
6. Consult your adult sponsor, an expert in the field and an elder
7. Conduct your experiment
8. Examine your results
9. Draw conclusions

CATEGORY CODES/DESCRIPTION

The student/adult sponsor must decide in which category the student is competing. If you have questions please contact a member of the Kodiak Island AISES science review committee

BE = BEHAVIORAL AND SOCIAL SCIENCES

Human and animal behaviors, social and community relationships: psychology, sociology, anthropology, archaeology, ethology, ethnology, linguistics, animal behavior (learned or instinctive), learning perception, urban problems, reading problems, public opinion surveys, educational testing, etc.

BI/MI = BIOCHEMISTRY & MICROBIOLOGY

Biochemistry includes chemistry of life processes, molecular biology, molecular genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry

Microbiology includes biology of microorganisms, bacteriology, virology, yeast, etc.

BO = BOTANY

Study of plants, agriculture agronomy, horticulture, forestry, plant anatomy, etc.

CH = CHEMISTRY

Study of nature and composition of matter and laws governing physical chemistry, organic chemistry, materials, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.

EA = EARTH AND SPACE SCIENCES

Geology, geophysics, physical oceanography, meteorology, atmospheric physics, seismology, petroleum, geography, numerology, topography, optical astronomy, radio astronomy, etc.

EN/CS/MA = ENGINEERING, COMPUTER SCIENCE/MATHEMATICS

Engineering includes technology, projects that directly apply scientific principles to manufacturing and practical uses, civil, mechanical, aeronautical, chemical, electrical, photographic, sound, automotive, marine, heating and refrigerating, etc.

Computer Science includes new developments in software or hardware, information systems, computer systems organization, computer methodologies, and data, including structures, etc.

Mathematics includes the development of formal logical systems or various numerical and algebraic computations and the application of these principles, calculus, geometry, abstract algebra, number theory, statistics, and other topics in pure and applied math.

EV = ENVIRONMENTAL SCIENCES

Study of pollution sources (air, water, and land) and their control, waste disposal, impact studies, environmental alteration (heat, light, irrigation, erosion, etc.)

ME = MEDICINE AND HEALTH

Study of diseases and health of humans and animals, medicine, dentistry, pharmacology, veterinary medicine, pathology, nutrition, sanitation, pediatrics, dermatology, etc.

PH = PHYSICS

Theories, principles, and laws of governing energy and the effect of energy on matter, solid state, optics, acoustics, particle, nuclear, atomic plasma superconductivity, etc.

ZO = ZOOLOGY

Study of animals, animal genetics, ornithology, herpetology, entomology, animal ecology anatomy, paleontology, cellular physiology, animal husbandry, etc.

TL = TEAM—LIFE SCIENCES**TP = TEAM—PHYSICAL SCIENCES**

Team Projects compete in two categories—Life Sciences and Physical Sciences. Each member of the team should be able to serve as spokesperson, be fully involved with the project and be familiar with all aspects of the project. The final work should reflect the coordinated efforts of all team members

WORKING DRAFT

Alutiiq Cultural Values

Written by Elders of the Alutiiq Nation

Knowledge of our origins; we are the First People of southern coastal Alaska

Knowledge of our history and that of this place in which we live. We must understand the events that have shaped our lives and of those of previous generations.

Heritage of our language and the Alutiiq way of using English

Family and the kinship of ancestors and living relatives

Ties to place: our villages and the cultural landscape

A subsistence life style, respectful of and sustained by the natural world

Our traditional arts

Our spiritual life, from ancestral beliefs to diverse faiths of today

Helping Elders; this provides a blessing

Sharing: we welcome everyone

Faith

Trust

Pride in our people; we are to never forget where we've come from

Sense of Humor

Learn by Doing, Observing and Listening

CHECKLIST FOR ADULT SPONSOR, SCIENCE TEACHER/EXPERT IN THE FIELD AND ELDER

Student Name _____ Grade _____

I have reviewed and signed the research plan. Yes No

The student and parent/guardian have signed the research plan. Yes No

SA = Strongly Agree N = Neither agree nor disagree
 A = Agree (or does not apply)
 D = Disagree SD = Strongly Disagree

In your opinion this project reflects or maintains the following values:
 (circle the letters that most closely fits your opinion)

History of the Alutiiq	SA	A	N	D	SD
Alutiiq Language	SA	A	N	D	SD
Alutiiq Kinship	SA	A	N	D	SD
Ties to Place	SA	A	N	D	SD
Subsistence Lifestyles	SA	A	N	D	SD
Respect for the Natural World	SA	A	N	D	SD
Traditional Arts	SA	A	N	D	SD
Alutiiq Spirituality	SA	A	N	D	SD
Helping Elders	SA	A	N	D	SD
Sharing	SA	A	N	D	SD
Trust	SA	A	N	D	SD
FAITH	SA	A	N	D	SD
Pride in Alutiiq People	SA	A	N	D	SD
Sense of Humor	SA	A	N	D	SD
Learn by Doing, Listening and Observing	SA	AN	D	SD	

Signature _____ Role _____ Date _____

Alutiiq Cultural Values
 The Kodiak Island AISES Science Fair will support and endorse the Alutiiq Cultural values during the fair. The elder judges will evaluate projects on their ability to maintain Alutiiq values.

FIRST ANNUAL KODIAK ISLAND AISES SCIENCE FAIR 98

PROJECT REGISTRATION FORM

DEADLINE: ENTRIES MUST BE POSTMARKED NO LATER THAN NOVEMBER 11, 1998

To participate you must:

1. Submit this registration form by November 11, 1998 (entries must be postmarked no later than November 11, 1998).
2. Include a copy of your research plan and abstract.
3. Submit three copies of the checklist for adult sponsor, a teacher/expert in the field, and an elder with their signatures.
4. Complete all information on this registration form.

PROJECT INFORMATION

Type of Project:

Collection Demonstration Experiment

Category Code _____ Grade Level _____

Individual Project Team Project

Title of Project: (limit to ten words or fewer)

Do you require an electrical outlet? YES NO

SCHOOL INFORMATION

School name _____ Phone _____

Address _____ Fax _____

Community / Village _____ Zip _____

Email (if possible) _____

Chaperone _____ Phone _____

Address of chaperone _____

PARTICIPANT INFORMATION

Single Entry Participant or #1 Team Member

Name _____ Age _____
Nickname _____ Grade _____
Address _____ Home phone _____
Village _____ Zip _____
Tribal affiliation _____ Gender _____
SS# _____ Birthdate _____

#2 Team Member

Name _____ Age _____
Nickname _____ Grade _____
Address _____ Home phone _____
Village _____ Zip _____
Tribal affiliation _____ Gender _____
SS# _____ Birthdate _____

#3 Team Member

Name _____ Age _____
Nickname _____ Grade _____
Address _____ Home phone _____
Village _____ Zip _____
Tribal affiliation _____ Gender _____
SS# _____ Birthdate _____

ABSTRACT

After finishing your research and experimentation, you are required to write a (maximum) 250-word abstract if you are in grades 9 through 12. An abstract is a summary of the whole project. It should begin with the objectives or purpose of the project followed by the methods and the materials used to carry out the project. It should conclude with the results obtained (in summary form) and/or the conclusions drawn. Use a separate sheet of paper. It must be no longer than 250 words. **NOTE: A COPY OF YOUR ABSTRACT MUST BE DISPLAYED WITH YOUR EXHIBIT.** Include in your data book.

POTLUCK AWARDS DINNER (THURSDAY EVENING)

PLEASE JOIN US IN CELEBRATING THIS EVENT!

RETURN FORMS AND PAYMENT TO:

Teri Schneider
First Kodiak Island AISES Science Fair 98
Kodiak Island Borough School District
722 Mill Bay Road
Kodiak, Alaska 99615
Phone 486-9031 Home 486-2455
Fax 486-7020

PLEASE SIGN AND HAVE PARENT OR GUARDIAN(S) SIGN BELOW:

LIABILITY FOR EXHIBITS

Every effort will be made to protect your exhibit. However, since the Science Fair Exhibition will be open to the public, the Kodiak Island AISES Science Fair cannot and will not accept any liability or responsibility of any nature for any theft of, or loss or damage to, any exhibit or any other property of any exhibitor. Accordingly, it is recommended that each exhibitor take product precautions to prevent any theft, loss or damage to his/her exhibit and/or other property. Each exhibitor should secure and guard his/her exhibit and/or other property at all times during the exhibition, and remove all valuable components, especially those which are easily portable, when the exhibit and/or other property is left unguarded by the exhibitor. Computers should be secured with cables at all times by the exhibitor.

I have read the above paragraph, and understand and accept that the First Annual Kodiak Island AISES Science Fair cannot and will not accept any liability or responsibility for theft or damage to any exhibit.

 Single entry participant/Team member #1 signature

 Parent/legal guardian signature

 Team member #2 signature

 Parent/legal guardian signature

 Team member #3 signature

 Parent/legal guardian signature

 Adult sponsor

 Date

PUBLICITY

The First Annual Kodiak Island AISES Science Fair is a prestigious event and your presence there is newsworthy. The KIBSD and other sponsoring organizations may want to publicize their involvement in such an important science competition by using photographs or information about you. Your cooperation may make it possible for other promising young student to get involved in science.

You have my permission to use appropriate information about me for publicity purposes. This includes any photographs, videos, or likeness(es) that may be used by AISES, the First Kodiak Island AISES Science Fair, Kodiak Island Borough School District, Alaska Native Knowledge Network, and/or Alaska Rural Systemic Initiative, or the sponsors for the purposes of illustrations, advertising or publication in any manner. I also consent to the use of my name in connection therewith.

 Single entry participant/Team member #1 signature

 Parent/legal guardian signature

 Single entry participant/Team member #2 signature

 Parent/legal guardian signature

 Single entry participant/Team member #3 signature

 Parent/legal guardian signature

 Adult sponsor

 Date

CONDUCT CODE

If your project is a team project, make one copy of this conduct code for each team participant. Each participant along with his/her parent or legal guardian must carefully read this conduct code

and sign the code, and send in with the registration form. No student will be admitted to the fair who has not signed a copy of the conduct code.

Whenever there is a meeting or gathering under the name of AISES (American Indian Science and Engineering Society) the following conduct code is maintained. Having a safe environment for students and adults to learn and develop into productive community members is highly cherished by AISES leadership and membership. Therefore we request that you read over carefully the following code and sign as a symbol of your personal commitment to this code.

During the entire three days of the Science Fair (November 18-20), as well as during my travel to and from the fair:

1. I will not use or abuse any alcoholic beverages, nor drugs;
2. I will not engage in any verbal or physical abuse of any human being.
3. I will not engage in any sexual harassment nor inappropriate touching.

These values are important to me and I am proud to sign this document, to confirm my commitment to them.

Participant signature

Date

Parent/legal guardian

Date

THE SCIENTIFIC METHOD

COLLECTION/OBSERVATION (K–3 ONLY)

What? When? Where?

- Definition
- Labels
- Display
-

DEMONSTRATION (K–12 LOCAL, K–8 STATE & NATIONAL)

How? When? Where? One Condition.

- Statement of Purpose
 - Why are you doing the project?
- Gather information
 1. Interview—Elder/Expert
 2. Literature Review—Sources of Information
 3. Observation
 4. Personal Experience
- Build a Model (optional)
- Charts, Maps, or Flowcharts
- Pictures
- Explanation
-

EXPERIMENT (K–12)

Why?, What if? Two or more conditions. (Comparing control group to experimental group.)

- Hypothesis
- Sources of Information
- Experimental Group(s)
- Control Group
- Variables
 - Independent (being changed, input)
 - Dependent (outcome)
- Result
- Charts, Graphs, Data Table (keep a journal/log)
- Conclusion: Research paper?
 - Application: Abstract