

Fourth Annual
Interior Alaska Native
Science & Engineering Fair

HANDBOOK

December 7 – 8, 2000

at
University of Alaska Fairbank
Natural Science Facility
Fairbanks, Alaska

For more information, contact

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University of Alaska Fairbanks
Interior-Aleutians Campus
Harper Building
PO Box 82831
Fairbanks, Alaska 99775
November 1, 2000

Dear Teachers/Students:

We would like to invite you and your student to the Fourth Annual ANSES Science Fair 2000, The fair will be held in the 2nd and 3rd Floor of UAF Natural Science Facility, Fairbanks, Alaska. The Opening Ceremony is at 6:00 pm to 8 pm. Thursday, December 7, 2000.

Registration deadline is Thursday, December 7. Students will set-up their projects anytime between 8 am and 6 pm., December 7, 2000. The Awards Ceremony will be held Friday Evening, December 8, 2000. Awards Ceremony includes the Potluck dinner. It is open to educators, friends and relatives of the participating students.

Any student of the eleven Rural Interior School Districts in grades 5-12 is eligible to participate in the Fourth Annual Interior ANSES 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 December 7, 2000. Since elders will lead all participants in traditional Athabascan Dancing, students are invited to wear traditional dress at the Fair and Awards Potlatch.

- All Grades: Projects must adhere to display and safety regulations. (see Page)
- Grades 9-12 Every student in grades 9 - 12 must submit a copy of their project's abstract with their registration form.
- Grades 5 - 8 Fill out and sign the registration form.

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

Participants and chaperones are responsible for their own travel, room, and meals, while at the science fair. Dixie Dayo can assist you with hotel and air travel arrangements.

Please read the enclosed information and guidelines carefully. If you have any questions, please contact, Alaska Native Knowledge Network: 907-474-5086, for assistance. We look forward to seeing you in Fairbanks.

Sincerely,

Claudette Bradley, ANSES Coordinator
Dixie Dayo, ANKN Staff Assistant

TENTATIVE AGENDA

December 7 – 8, 2000

Thursday, Dec. 7

Noon - 6 pm	Registration/Check-in/Set-Up Projects
6 :00 – 8:00 pm	Opening Ceremony includes: Athabascan Dance and Reception
7: 30 - 8:30 pm	Science Fair Committee Walk Through of Exhibits

Friday, Dec. 8

8:45 - 9:00 am	Judges Registration/Check-In/Briefing
9:00 am - 1 pm	Judging with student participants only
1 pm - 2 pm	Lunch Break On your own.
2 pm - 5 pm	Judging meet without students participants.
6 pm - 8 pm	Awards Ceremony includes: Potluck and Athabascan Dancing
8 pm - 10 pm	Participants Take Down Projects

*Deadline

Registration form with Project Abstract (if required), Conduct Code, Publicity and Parent Permission Forms must be received by December 7, 2000.

*Eligibility Requirements

Grade 5 - 12 students in the following school districts:

Alaska Gateway SD, Galena City Schools, Iditarod SD, Nenana City Schools, Tanana Schools, Yukon Flats SD, Yukon/Koyukuk SD.

Grade K - 4 students in the Interior School Districts listed above 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. dried plant material (eg, wood)
3. taxidermy specimens or parts (eg animal skins, leather)
4. preserve vertebrate or invertebrate animals (includes embryos)
5. soil or waste samples
6. chemicals including water
7. human/animal parts (exceptions: teeth, hair, feathers, nails, dried animal bones, histological sections, and wet mount tissue slides)
8. Human or animal food
9. sharp stems(ie, syringes, needles, pipettes)
10. poisons, drugs, controlled substances
11. dry ice or sublimating solids
12. flames or highly flammable display materials
13. tanks that have contained combustible liquids or gases, unless purged with carbon dioxide.
14. batteries with open top cells.
15. awards, medals, business cards, flags, etc.
16. hand-outs to judges must be limited to one page narratives related to the essentials of this year's project. Personal accomplishments, acknowledgments, addresses, and phone and fax numbers are not permitted.
17. photographs or other visual presentations depicting vertebrate animals in other-than-normal conditions (ie taxidermy surgical techniques, dissection, necropsies or other lab techniques)

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
Lazar radiation: Do Not Stare into Beams
(ANSES 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 noncombustible 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.

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

Eligibility

Any 5 - 12 grade student in the following School Districts of Interior Alaska is eligible to participate in the Fourth Annual Interior ANSES Science Fair 2000.

Alaska Gateway SD, Galena City Schools, Iditarod SD, Nenana City Schools, Tanana Schools, Yukon Flats SD, Yukon/Koyukuk SD.

Requirements

Every 9th - 12th grade student must complete a project abstract and Registration forms. The abstract should be a (maximum) 250 words (one page) which summarizes the work for the project. The abstract must describe the 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 with the display board. The abstract must be included in the data book.

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

Judging

There will be two sets of judges:

- a. Elders of the Interior Region
- b. Teachers/Scientists

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

1. How well did the student maintain Athabascan Values? (See List of Values)
 - a. Athabascan Values (20 Points)
 - b. Presentation to Judges (10 points)
2. Is the project meaningful to Athabascan culture? (10 Points)
3. Is the project meaningful to village life? (10 points)
4. Is the project meaningful to land and assets of village corporations and Native Corporations (10 points)

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? Did you start with four experiments and finish only three?

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: What didn't you do? 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, physics.

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

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 Fairbanks, then documentation should be available which supports each team member's involvement with the project.

A team project cannot be converted into an individual project. A new member may not be added to a continuing team project, but two original team members may continue their research if the third member no longer participates.

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. 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.

Athabascan Values

The Interior Alaska AISES Science Fair will support and endorse the Athabascan Values during the Fair. The Elder judges will evaluate projects on their ability to maintain Athabascan Values. The following list was established by the Denakanaaga Elders Conference in 1985 and summarizes the values of the Athabascan people of the Interior of Alaska.

- Self-sufficiency/hard work/providing for family
- Humor
- Honesty/Caring
- Respect for Others
- Village Cooperation/Responsibility to Village
- Family Relations/Unity
- Love for Children
- Respect for Elders

Respect for Knowledge and Wisdom from life Experiences

Respect for the Land

Respect for Nature

Practicing Native Traditions

Honoring Ancestors

Spirituality

Who's Involved in a Science Project?

The Adult Sponsor

An adult sponsor may be a teacher, parent, university professor, or scientist in whose lab the student is working. This individual must have a solid background in science and 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 Athabaskan 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 Fourth Annual Interior ANSES Science Fair.

Project Review Committee

All projects must be reviewed by three persons: the adult sponsor, a science teacher or expert in the field, and an elder in the community. Each committee member must fill out and sign the Athabaskan 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/guardian. Consent forms should be included in the projects data book.

None of the student's project review committee members should serve on the Interior ANSES Science Review Committee. This eliminates conflict of interest.

Interior ANSES Science Review Committee

Claudette Bradley.....	907-474-5376
Alan Dick.....	907-526-5212
Larry Duffy.....	907-474-7525

The Interior ANSES Science Review Committee examines projects prior to judging, December 8, 2000. The committee will look for:

1. Evidence of library research
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 Athabaskan Values
7. Appropriate use of DNA, pathogenic organisms, and controlled substances (when it applies)

Committee Schedule:

1. Before judging commences, 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 Athabaskan Values and Scientific Method.

2. On December 7 – 8, the Science Review Committee will review the project displays of the same projects to make sure the students followed their research plan and the Athabaskan Values.

3. Projects, which do not comply with their research plans and Athabaskan 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. Accurate and detailed notes make a logical and winning project. Good notes show consistency and thoroughness to the judges, and help when writing the paper. **REMINDER:** Log all hours of project work time. This is checked by the Science Review Committee and Judges.

Include your abstract, copies of consent forms (if needed), copies of the Athabaskan Checklist with signatures, journal notes or log, and data sheets for collection of data.

ABSTRACT

After finishing your research and experimentation, you are required to write a (maximum) 250-word abstract, if you are in grades 9 thru 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.

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 advice 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 your procedure and materials.
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 Interior Alaska AISES Science Review Committee

BE Behavioral and Social Sciences

Human and Animal Behaviors, Social and Community Relationships - psychology, sociology, anthropology, archaeology, 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, plastic, 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 pollutions (air, water, and land) pollution sources 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

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
- A - Agree
- N - Neither agree nor disagree
- 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)

Self-sufficiency	SA	A	N	D	SD
hard work	SA	A	N	D	SD
providing for family	SA	A	N	D	SD
Humor	SA	A	N	D	SD
Honesty	SA	A	N	D	SD
Caring	SA	A	N	D	SD
Respect for Others	SA	A	N	D	SD
Village Cooperation	SA	A	N	D	SD
Responsibility to Village	SA	A	N	D	SD
Family Relations	SA	A	N	D	SD
Unity	SA	A	N	D	SD
Love for Children	SA	A	N	D	SD
Respect for Elders	SA	A	N	D	SD
Respect for Knowledge and Wisdom from life Experiences	SA	A	N	D	SD
Respect for the Land	SA	A	N	D	SD
Respect for Nature	SA	A	N	D	SD
Practicing Native Traditions	SA	A	N	D	SD
Honoring Ancestors	SA	A	N	D	SD
Spirituality	SA	A	N	D	SD

Signature _____

Role _____

Date _____

Fourth Annual Interior ANSES Science Fair 2000
Project Registration Form

DEADLINE, December 7, 2000

To Participate you must ...

1. Submit this registration form by December 7, 2000.
2. Include a copy of your abstract.
3. submit three copies of the Checklist for Adult Sponsor, a Science Teacher/Expert in the Field, and an Elder with their signatures.;
4. Complete all information on this registration form

Project Information:

[_____]
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 _____

Village _____ Zip _____

Email (if possible) _____

Chaperone Accompanying student: _____

Address of Chaperone _____ Phone _____

Participant Information:

#1 Individual or Team Member

Name _____ Age _____

Nickname _____ Grade _____

Address _____ Home Phone _____

Village _____ Zip _____

Tribal Affiliation _____ Gender _____

SS# _____ Birthdate _____

#2 Team Member

Name _____ Age _____
Nickname _____ Grade _____
Adresss _____ Home Phone _____
Village _____ Zip _____
Tribal Affiliation _____ Gender _____
SS# _____ Birthdate _____

#3 Team Member

Name _____ Age _____
Nickname _____ Grade _____
Adresss _____ Home Phone _____
Village _____ Zip _____
Tribal Affiliation _____ Gender _____
SS# _____ Birthdate _____

Awards Potlatch (Friday Evening)

Invitations are available for non-project participants such as chaperones, educators, friends, and family members.

Return Forms to:

First Interior ANSES Science Fair
Alaska Native Knowledge Network
PO Box 756480
Fairbanks, Alaska 99775
FAX 907-474-5208
Phone: 907-474-5086

Please Sign and have parent/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 Interior ANSES 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 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 Fourth Annual Interior ANSES Science Fair 2000 cannot and will not accept any liability or responsibility for theft or damage to any exhibit.

participant's signature

Parent/legal guardian signature

participant's signature

Parent/legal guardian signature

participant's signature

Parent/legal guardian signature

Adult Sponsor

Date

Publicity

The First Annual Interior ANSES Science Fair is a prestigious event, and your presence there is newsworthy. The organization or businesses sponsoring awards at the Fair 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 Interior Alaska AISES Science Fair, 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.

participant's signature

Parent/legal guardian signature

participant's signature

Parent/legal guardian signature

participant's 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 ANSES (Alaska Native 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 ANSES 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 (December 7 – 8, 2000), as well as during my travel to and from the fair I will

1. not use or abuse any alcoholic beverages, or drugs;
2. not engage in any verbal or physical abuse of any human being.
3. not engage in any sexual harassment, or inappropriate touching.

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

Participant's Signature

Date

Parent/Legal Guardian

Date

THE SCIENTIFIC METHOD

I. Collection/Observation (K - 3 only)

What? When? Where?

Definition

Labels

Display

II. Demonstration (K-8 only)

Answers: How? When? Where? One Condition.

Consists of:

Statement of Purpose

Why are you doing the project?

Gathering of information

1. Interview - Elder/Expert
2. Literature Review-Sources of Information
3. Observation
4. Personal Experience

Build a Model

Charts-Maps-Flowcharts

Pictures

Explanation

III. Experiment (K - 12)

Answers: Why? What if? Turned into hypothesis: Two or more conditions.

Consists of:

Hypothesis

Sources of Information

Treatment Group(s)

Control Group

Variables:

Independent (being changed, input)

Dependent (outcome)

Result:

Charts, Graphs, Data Table-keep a journal/log

Conclusion of the research

Application and abstract

Acknowledgements-Bibliography