

COSEE Science Fair Guidebook

Fair Guidebook Introduction.

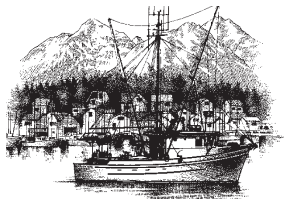
For decades, science fairs based on contemporary Western science have served well to establish the precedent in Alaska. However, starting in 1996 the Alaska Rural Systemic Initiative sponsored local and regional fairs that insisted that students do projects stemming from local communities' present or past traditions and activities. When students did projects rooted in their home towns, the quality of the projects soared. In 1999, AKRSI sponsored the first of many ongoing State Science Fairs with the same emphasis.

Local Elders were considered experts along with Western scientists. Families were immediately drawn into the school effort. Students were encouraged to find projects from their community and from their parents' way of making a living. Enthusiasm was released like an artesian well. Students found meaning in science and real life applications of what they were learning in school.



COSEE will follow that successful model- However, COSEE's focus is upon oceans, watersheds, and climate change, which, in reality, is most of what relevant Alaskan education is about.

COSEE will also work closely with the Alaska State Science fair, sponsored by the Anchorage School District, traditionally held during March or April of each year. School budgets have been tightening for many years. The challenges must be met with creativity, keep-



ing State, regional and local fairs going while adapting to new opportunities and pressures.

Culturally relevant projects.

Any project based on activities in the student's community, whether past or present, is locally/culturally relevant. This is opposed to a project on lunar landings or alligators. Mosquitoes, yes. South Pacific dolphins, no.

State Standards.

Cultural Standards adopted by the State of Alaska Department of Education are met when students are actively involved in developing a locally/culturally relevant science project.

Numerous State science standards are met when doing science projects.

COSEE's Role

COSEE will do the following:

Local

- Provide information on how to conduct a local or regional fair. This booklet is part of that effort. The COSEE Science Fair Website is another.



See: www.ankn.uaf.edu/COSEE

- Provide suggestions and guidelines for finding and developing locally/culturally relevant science projects.
- Provide video and other successful helps that were developed in the past during the time of AKRSI science fairs. See the ARSI website for streaming video, or where to order DVD's. www.ankn.uaf.edu
- Further help for COSEE affiliated school districts. If schools or districts want further help beyond what the book and website provide, COSEE staff will provide email and Skype assistance. If help beyond that is needed, COSEE staff will visit schools and spend time needed to get science fairs and projects going. Email: alanlime06@yahoo.com

Statewide

- COSEE provides guidance and direction, based on years of experience, for local and regional fairs.

- COSEE sponsor a portion of the Alaska State Science Fair, with awards and rewards for projects outstanding in the area of oceans, climate change and river drainages.
- COSEE is *not* able to provide funding for transportation, lodging or meals.

Timing of Fairs

Traditionally in Alaska, local science fairs have been scheduled to so winners can compete in the Alaska State Science Fair in Anchorage during late March or early April. We strongly encourage attendance in the State Fair. There's nothing that boosts a student's self image like "going to State." At the same time, local needs and student enthusiasm are extremely important. If students come back from a summer camp with many projects, it would be most appropriate to have a fair in October while the ideas are still fresh. The students will have lots of time to improve the project before the State Fair.

Who Is Involved?

The Student

Any student enrolled in an Alaskan school or distance education program is eligible to participate in the COSEE fair. Special encouragement is provided for COSEE affiliated school districts, but no Alaskan school is excluded.

Every effort should be made to accommodate handicapped individuals in local and State fairs.

Adults

This group includes:

- **Two local elders.** (Grandma and grandpa are perfectly acceptable elders.) The elders guide the student to pursue the project in a way that is acceptable in the local community. This may vary from region to region, but gives local control over standards rather than an umbrella of regulations from distant authority.
- **A certified teacher** who says the project is safe for the student and academically worthy. The teacher should be familiar with potentially dangerous projects. This may include: thin ice, hypothermia, firemaking materials, boating and firearm safety as well as handling of chemicals, experimental techniques, research involving human or nonhuman animals. The

issues must be discussed with the student previous to and during planning.

Rules, Regulations & Requirements

Projects that will be physically present at the Alaska State Fair must follow all guidelines established by the governing authorities.

Projects that will compete in the COSEE Fairs should follow COSEE rules, regulations and requirements.

Reasons for Rules

Students need to compete fairly in a safe environment.

No compromise for safety should ever be made.

This isn't to "cover" teachers in case a student gets hurt! This is to teach students safe practices. Many young people have the attitude "It won't happen to me." Students need to realize that disbelief in consequences does not prevent their occurrence. At the same time, the fair should not be a line-up of sterile posters and notebooks. If local elders, local experts and teachers think a project is safe, it probably is.

On the National level, the situation is different. If students from Florida brought oranges for display, insects might be carried home to California and harm crops there. The National Fair doesn't allow water in a display for that reason.

The advantage of video recording an event is that any and all materials can be displayed quite easily with no hazards to other communities.

Rule #1.

Rule #1 has to be: Have fun! If the project doesn't inspire curiosity and scientific inquiry and have an energy of its own... don't do it!

A few less important rules follow:

Project topics

Projects should be related to oceans, freshwater drainages, and climate change. That's what COSEE is all about. Very few projects in Alaska don't apply to oceans, drainages and climate change. The topics should be relevant to the students' lives.

Approval by...

Projects for local and regional fairs must meet the signed approval of a State certified teacher that the project is physically safe and academically meaningful for the student(s). The project must also be approved by at least two local elders who determine that the project is culturally relevant, respectful of local traditions, and meaningful to the local community.

1. Projects presented for the State Cyber Fair must also meet the above criteria.
2. Projects presented in person at the State Fair must meet the COSEE requirements as well as comply with State Fair rules and guidelines.

Example: A project involving seal hunting techniques is acceptable for electronic presentation if it is deemed safe and academically meaningful by both a State certified teacher and approved by two local elders. To qualify for presentation in person at the State Fair, it must meet the State regulations for vertebrate projects (which are quite stringent.)

Number of students involved

Projects can be submitted by individual students, teams of 2-3 students, or a whole class. Obviously, scoring criteria will be different for each of these categories. It hasn't yet been determined how to weight the scoring when a single student competes with a whole class, but the playing field will be leveled.

Judges

All projects will be judged by two sets of judges, professional western scientists and Elders from across the state. Both sets of judges will use a different scoring rubric, and fair winners must satisfy both sets of judges. Scoring rubrics.

Parent and adult involvement

Many projects win or lose based on the amount of adult involvement. Those hosting a science fair very much want parents involved in the project! They do not want fourth graders competing with overinvolved parents.

The simple rule is:

“Words... no hands.”

That's fair!

If an adult holds the video camera, or helps the student by holding a pole while the student does the work, that's certainly OK. If a local Elder first demonstrates how to skin a fur bearing animal, and the student then does it by him/herself, that's OK.

The parent can coach, cheer, encourage and console, but the adult should *not* do the actual work or the writing.

National and International Fairs

Alaska has an incredible wealth of opportunity for unique science projects. We have opportunities to do original work like no other place in the US. It would be a shame to sacrifice the intent of a good Alaskan project in order to meet requirements designed thousands of miles from here for projects that have no relevance to our lifestyle. At the same time, it is a great honor to go to Nationals. Should the project comply with National rules on the slim chance that it will go to the National Fair?

That question has difficult and personal implications.

Display and Safety Regulations

Most fairs ban the following for obvious safety reasons:

- Highly flammable or hazardous chemicals or materials.
- Poisons, drugs, controlled substances, HASMAT. Project materials should meet FAA requirements for transport. Don't assume! Inquire.
- Tanks that contain combustible liquids or gases.

Display items that should require permission previous to display at a local or regional fair:

- Sharp items like knives, ulu's, porcupine quills, needles etc.
- Strong smelling items
- Dry ice
- Pressurized tanks that contain non-combustibles.
- Any apparatus producing temperatures that will cause physical burns or freezing.
- High-voltage wiring, switches, and metal parts without adequate insulation.
- Unsafe electrical connections. 110-volt AC circuits should be soldered or made with approved connectors. Connecting wires must use wire nuts and electrical tape. Cords must be UL approved.
- Bare wire and exposed knife switches may be

used only in circuits of 12 volts or less; otherwise, standard enclosed switches are required.

- Any liquid that is acid or base, i.e. above or below pH 6.5-7.5
- Lasers.
- Large vacuum tubes or dangerous ray-generating devices.
- Projects that involve live animals or people.

Any display involving the above issues should get an OK from COSEE State or local fair organizers.

Usually acceptable for Display...Cannot be operated on site:

- Projects with unshielded moving belts, pulleys, chains, and parts with tension or pinch points
- Class III and IV lasers
- Any device requiring over 120 volts

Teachers and local elders should set necessary further stipulations for display for the above projects in a local or regional fair.

Size of Project Space

A project in a local fair may take up to half a table. Projects requiring more space than this should get permission previous to the fair.

Overall Requirements

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. The consent form should clearly state all activities. Offended parents do not enhance the quality of a project. Remember... respect.

Repeat project

A student may improve on a project from a previous year, but the report from that year should accompany the second year's project so judges can see how much new work the student has done.

Team Projects

There is no limit to how many students can work on a team project, but there usually can be no more than 2-3 presenters.

Each member of the team should be able to serve as spokesperson, be fully involved, and be familiar with all aspects of the project.

The main concern with team projects is that some

team members tend to be less involved. The judges will assess if all presenters were actively participating in all aspects of the project.

Class projects

Science projects are extremely time consuming for teachers. A single class project makes a science fair entry possible. In local and regional fairs scoring can be weighted so a single student competing with a class will not be at a disadvantage. The quality of a class project should reflect the number of students involved.

Categories

COSEE has identified three categories of projects. Remember the emphasis is on oceans, watersheds and climate change:

- Collections
- Experiments
- Scientific Observations

Consideration will also be made for differences in grade levels.

A Top Notch Science Project Should Include

Local Elder Guidance

The distinguishing feature of a project in a COSEE fair is that the student has spent considerable time consulting with elders in the community. This accomplishes many objectives. It identifies the elders as valuable resources. It validates local knowledge. It links the student with his/her past. It teaches the application of local knowledge to modern science concepts. It creates bonds between the students and the elders so other information can flow between the generations. It allows the teaching of local values along with local activities. It brings the school, community and students together in a healthy fashion.

A Good Display:

Poster

A good visual display attracts and informs.

Interested spectators and judges easily assess the project and results obtained. The display should use clear and concise expressions. Headings should stand out, graphs, and diagrams should be clearly and correctly labeled.

A display board stands alone with three panels.

It may be two-stories tall, but make sure it doesn't topple over onto other projects.

The poster usually includes:

- Identification: Name, grade, school and type of project.
- Title & original question. What question lurks in the student's mind to motivate the project?
- Hypothesis. What is the student's "best guess" how this will turn out?
- Materials used. What materials were used? This gives judges an idea how the project was performed.
- Data. What facts did the student find out? Include measurements, dates and notes. The original data book with "field stains" should accompany the project.
- Procedure. What steps did the student take to do the project?
- Results, and conclusion. The conclusion might easily contradict the original hypothesis. This is perfectly good science.
- Models, photographs, or drawings are often appropriate. The display board should be logically presented, easy to read, and eye-catching. Size and safety rules must be followed.

Handwritten materials don't do well when competing with computer-generated poster board materials.

Display as much of the project as possible. Clearly mark what can and cannot be touched, but if possible, allow people to feel the fur, touch fish skin boots, try the bow & drill fire-maker, etc. Make the project as interactive as possible.

Judging Criteria

The criteria by which Elders and Western science judges evaluate each project are different. Top winners satisfy both groups of judges.

Warning! Science vs. library project

In the past, students have gone to the library or internet and done exhaustive hours of work, have drawn good poster boards, including graphs and visuals, and don't do well in the fairs. Those students did not realize the difference between a library project and a science project.

A real science project gets the student involved *doing* something. The student tries several ways of accomplishing a task, or tries different weights, lengths, sizes, colors etc. in pursuit of an answer. Or, the student is actively involved in careful observations of a situation that could take years of observation to derive a conclusion.

A student should go to the library or internet to broaden his/her understanding, get definitions, clarify concepts or find more examples. But the project should be based on the student's experience, not a description of someone else's efforts.

For that reason, models of "life on the moon," "save the owls" generally have not scored well, as there is little the student can interact with. The teacher needs to work with the student to turn this type of interest into a "do-able" project that will score well with both groups of judges.

Example: One student was interested in forensics. Lacking a dead body to experiment with, we helped her develop a related project on ballistics and the rate of burn of different types of gunpowders.

ORGANIZING A LOCAL OR REGIONAL FAIR

If you are going to run a fair, the following reading will save considerable time and help avoid mistakes.

Location

Choose a location that is economical and easy/safe to travel to/from. Be careful that no site feels left out, but take weather, safety and amount of volunteer help into careful consideration.

Typically, the gym of a local school or National Guard Armory are used. Gyms are loud, large and impersonal. Students are used to horsing around in the gym. The gym or armory might be used for displaying projects, and another smaller room for awards and more intimate exchanges. It is hard to hear speakers in a gym, even with a sound system.

Urban centers are great locations for a fair, providing easy accommodations and transportation, but the temptation for visitors to go to movies and malls is a constant distraction from the fair.

Season/Date

This is a much-discussed topic.

- **Winners.** Winners often go on to State or Nationals. Decide if you want the local or regional fair to lead up to the Alaska State Science Fair. Obviously, your local fair should precede that fair if you want to

send winners.

- Seasons. Some teachers feel that an early winter fair is better because it draws from three seasons: the previous summer, fall and current winter. Summer camp experiences are fresh in students' minds. An April fair is usually limited to winter activities.
- The quiet period from the end of November to the second week of December has become a favorite time for many local or regional fairs.
- Many school districts are shifting to project based curricula, and find that an early fair sets the stage for all projects throughout the school year.
- Sports. Science fairs don't compete well with sporting events. Find the basketball schedule and work around it!
- Tradition. Traditionally, science fairs have been in late March or April as they lead up to the State Fair competition.
- Weather. Choose months when weather isn't too bad in your region. You don't want students weathered in or weathered out for long.

Preparing for the event

- Realize that *you* determine the rules for your own fair. Borrow from others, but create your own.
- What rules guide the preparation and performance of a project?
- What rules guide the display of a project?
- What categories will the projects register under?
- What are the criteria for judging?
- School principals need to know the financial expectations placed on their budgets. Get information out early in the school year before travel funds are committed to other activities.
- Far in advance, teachers and principals need:
 - Clearly stated rules, requirements & regulations.
 - Dates, times and location.
 - Judges scoring guides.
- Speakers need time to prepare.
- The public, including parents, need to know in advance the hours the fair will be open to the public.
- All judges need to know the dates, times, location, and what is expected of them. Give them the scoring guide far ahead of the fair

so they can think about it. Spend time with Elder judges over a cup of coffee, casually informing them of the intent of the fair and what is expected of them. Give them time to think of questions. Western science judges are very familiar with such fairs. It is foreign territory for elders.

- Where will visitors sleep?
- How many people are expected for meals?
- Who will take care of transportation?
- Do you have all contact numbers?
- What will you do if weather is bad: cancel or postpone?

Typical Schedule

Morning

- Students arrive and set up projects.
- Students practice presentations among themselves. 30 minutes.
- Students leave projects for 30-45 minutes. Judges look at all projects, getting an overview. This is very important for judges to get an idea "How good is good?" and for judging teams to agree among themselves. Projects evaluated by different teams are then regarded in the same terms on the same scale.
- Judging starts.

Afternoon

- Judging continues.
- Students leave, and judges confer, deciding on awards. This is a good time for team/peer building activities among students. See "Judge by Tables"
- Judges deliberate, choosing "Best of Show" and Grand Prizes.

Evening There are two options:

Option #1

This makes for a shorter evening.

- After deliberation while all participants and the public are out of the room, ribbons are hung on all projects, elders ribbon on one side of the project, western science judges' ribbons on the other. Each project then gets two ribbons. Everyone is then excluded until the doors open after supper.
- After supper (potluck?)
- Doors burst open.
- Students and the public enter the fair site, looking at projects and associated ribbons.
- Awards ceremony and elder speeches. Ribbons are given for "Best of Show" and "Grand Prize." All

students are acknowledged.

- “Grand Prize” and “Best of Show” ribbons are hung on projects, and students stand by projects for pictures and questions from public for 20-30 minutes.

Option #2

This makes for a longer evening.

- After supper (potluck?)
- Fair site is open to the public. At this time, there are no ribbons on projects.
- Awards ceremony. All blue, red and white ribbons including “Best of Show” and “Grand Prize” are given.
- Talks by significant leaders and individuals or other scientific presentations.

If you follow this option, it is *very important* to have students display ribbons and stand beside projects after awards are presented so everyone can make the connection between projects and awards. It is a good “photo op.” People tend to think the fair is over when awards are over, so announce that projects will be on display for another 30 minutes or so.

Alternate schedule.

Noon: Set up projects.

- 30 minutes Students practice on each other.
- 45 minutes Judges get overview of projects
- Judging until late afternoon

Supper

- Evening activities.
- Noon the next day. Awards banquet.
- Afternoon Return home.

Considerations

The alternate schedule allows all evening for tallying the scores and deciding on best-of-show among the judges. The typical schedule gets frantic for time if there is debate among the judges. On-site meals for judges are a must. A student spends weeks and even months of a project. Each one deserves careful attention. This process should not be rushed, yet often is.

On the other hand, the alternate schedule keeps many working parents from the awards ceremony, unless activities are planned for all day, and the awards are held that night.

Organizing

The days of travel, particularly arrival, are often hectic. People arriving from other towns need contact numbers, location of lodging, schedules and event locations all in a packet.

A designated driver on the day of arrival for the fair is a must. A cell phone for the driver is a tremendous help. Travelers should have the cell number. Getting people to planes to go home is much easier than gathering them on the first day. They seem to vanish quite well with minimal assistance.

Know where the extra tables, extension cords and mops are kept. Know where the breaker boxes are. Who has the keys on the weekend? What do you do in an emergency? How can parents call students if the school office is closed?

Administrators, cooks and janitors in the building must know what is going on and how their job will be impacted.

If students and teachers do not know each other, it is good to have an ice-breaking activity that gets people acquainted right away.

Designate one person to take memorable pictures or video.

Critical Dates Before the Fair

- Permission for projects that require approval for performance of display.
- Registration. It really helps to know how many projects are involved 5... 12... 25?
- Dates and times of the Fair
- Check-in/set-up
- Opening ceremony
- Judging schedule. All students must be present at their own exhibit for questioning by the judges.
- All group activities.
- Exhibits open to the public. This is important, as “Kids tell your parents” seldom works.
- Dinner and awards ceremony
- Dismiss, take-down/cleanup

Judging

Quality judging is critically important so the students feel that their efforts have been fairly evaluated.

Elder Judges

Have several home visits with elders before the fair to insure that they understand what is expected of them. It is best to have elders from the community, as the values and details of the lifestyle are unique from region to region.

Elders don't always enjoy good health. Schedule a few back-ups in case some cannot attend.

- Edler preparation. Elder judges contribute a priceless dimension to the fair. Their presence gives honor and value.

However, since elders have little or no experience with science fairs, there are a few precautions that go a long way towards a successful fair. Asking them to judge a fair without instruction is like dropping a teacher blindfolded on the tundra.

- Grandchild. If an elder has a grandchild in the fair, try to avoid having the grandparent evaluate that student. This is only fair to the other students.
- Helper. Appoint someone who is familiar with science fairs to work with the elders. Give elders an idea of what to expect ahead of time. Tell them what the fair is for, how it will be run, why they are there and what is expected of them.
- Teams. Put the elders in teams of 2-3. If there are many projects, there might be two or three teams of elders. To provide fairness to students in judging, have each team judge a given category, like "Collections," or "Experiment."
- Identifying. Each project should have a one-word identifier like "nets." or "lamps" or "medicine." Put this on the top of the scoring sheet. (There might be two "nets" in the fair, thus the project number on the upper left.)
- Scoring. The elder scoring rubric identifies criteria. Practice and demonstrate on a simulated project before local elders evaluate all the projects. Include a copy of your local values with your elder scoring rubric. If your region doesn't have any listed or posted, this is a good opportunity to develop some.

Make sure local elders understand the scoring system of 1-5 or 1-10 and which is best and which is poorest.

This is best done on a relaxed day before the fair.

- Timing. Elders need a sense of how much time to spend on each project. One uninformed elder spent 45 minutes teaching a student how to set snares. No one told him what a science fair was or what was expected of him.
- Idea vs. work done. Elders need to understand the difference between a good idea and

a project well done. In the past, uninformed elders have overvalued a project with an important subject although the student's work was of lower quality.

- Chairs. Have chairs for elders to use during the interview. The person working with the elders can move the chairs from project to project. Be certain all elders can see and hear. As respect is shown the local elders in this way, students understand the importance of the generational link.
- Hearing. Elders' hearing must be adequate to understand the students in a large room with many noises.
- Scoring. Be sure all elders understand the criteria for scoring and how to score the project.
- Ribbons. Scoring is always hard because elders want to encourage everyone and discourage no one.

After judging, give elders a break.

While they are on break, on each elder score sheet, add the scores for each of the criteria and put the total on the top right of that scoring sheet. Don't confuse this number with project numbers! (Which should be on the top left.)

There should be a scoring sheet for each elder who evaluated each project. Staple them together, #23 with #23, #16 with #16 etc. This is where you discover whether all projects were judged or not! Make sure there are scoring sheets for every project! We have dismissed students before and found that all projects weren't judged.

Average the elders' scores for each project. You can use the totals for each one, but if one judging team had three members and another two, scores will be off. Averaging overcomes the problem.

Arrange the papers in ascending order, with the best on the right and "not-so-good" on the left.

Elders return.

Talk about the way the totals have come out. Does everyone think this is a fair rating for each project?

Take time on this part.

Revisit projects. Discuss the merits of each. Do the elders want to reevaluate a project now that the big picture is clearer? Refer to projects by name, "nets," "lamps," "deadfalls." Project numbers at this point are confusing. Don't rush this part. Give elders time. You might even have a meal at this point, giving them time for personal conversation.

Once there is consensus that the projects are in ascending/descending order, find the breaks in the scores. There is usually a large gap between the totals, like:

18, 18, 19, 20.....27,27,27,28,29,29,30.....36,36

These are often obvious natural breaks between the blue, red and white ribbons and the levels of performance. There is no given fraction that must be given of each color ribbon. Let the breaks and quality of projects determine the ribbons.

Confer with elders. Red, white and blue ribbons are sometimes unfamiliar symbols to Native elders. Telling them to group the projects. "Good," "better" and "best" might be better descriptions of the groups.

Do they think the grouping is accurate? Fair? Wait for consensus.

Western Science Judges

Western science judges can be found in government agencies and local industry. Some don't relate well to students. Casually interview them before inviting them to judge. The ability to understand students and possession of compassion are often more important than scientific expertise. We aren't delving into subatomic particles and quantum theory. Try to get a balance among judges as biologists far outnumber earth and physical science people in Alaska.

Western science judges are acutely aware of how to judge a science fair, as they have personally participated in so many. Western science judges and elders tally their scores separately. In the past, judges stapled all score sheets for a given project together, averaged the scores and placed that number in the upper right corner of the top score sheet in a bright color. When that is done, they grouped the projects in three ranges: high, middle, and low. The break between the three groups is usually obvious.

The high range gets a blue ribbon, middle range a red ribbon, and low range gets a white ribbon.

Important! Because the number of ribbons required for each group is not known ahead of time, it is good to have a *surplus* of ribbons of all colors.

They are cheap and reusable. Remember, there are two sets of judges, so double or triple your supply of ribbons.

Therefore:

Each project gets two ribbons, one from the Western science judges, and one from the Elders. It is possible for a project to get one blue and one white ribbon.

All projects should be clearly labeled as to category and assigned a project number. Put a line for project number on the upper left of the scoring sheet.

Local fairs might try using Skype on the internet and judges from another community. A laptop and wireless connection could be brought from project to project. Test this for audio and other glitches before the day of the fair. A noisy location might make it unworkable.

Best of show. For the ribbons that identify "Best of Show" and "Grand Prize" western science judges and Elders should be in agreement. Sometimes this takes strong negotiating, and other times it is quickly unanimous. The discussion is always healthy, as elders get to hear what the scientists value, and the scientists better understand the elders' viewpoint. There is no fixed number of projects in this upper category. Have extra awards on hand, but don't feel compelled to give them if the quality isn't there.

When the Western Science and Elder judges have a hard time coming to agreement there are two ways to help work out the differences.

1) Revisit the projects. The judges defend their choices to the other judges, giving reasoning. Do this for all the contenders. If you can tape this portion, the discussion is priceless. Students can later hear what the judges held in high regard. Be discreet in allowing students only to hear what judges say about their personal project.

2) Usually the two teams of judges can agree on one or two projects for Best of Show or Grand Prize. If there is ultimate impasse, then the Elders can pick one, and the Western science judges another. This solution should be a last resort.

Scoring Criteria

COSEE suggests scoring rubrics, but feel free to develop your own.

You might consider:

A. Elders

Elders review the projects for their alignment with traditional local values and for their contribution to the students' village/community.

- How well did the student maintain local values?
- Is the project important to local culture, city, town or village?
- Is the project of high quality, showing hard work?
- Has the student drawn upon local knowledge and experts, involving the community in the research?

B. Western scientists

Teacher/scientists evaluate an experiment or observation:

- How well did a student explained and understand the scientific principles involved?
- How well the student followed the scientific method? (Experiment)
- Detail and accuracy of data
- Creativity and originality
- Presentation
- Conclusions
- Appearance
- Use of materials

Teacher/scientist evaluate a collection:

- Quality and variety
- Creativity
- Good presentation
- Good data. Where and when items were gathered.

Overall, judges look for well planned work. They look at how significant the project is in its scientific field and to the community. They look for thoroughness.

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

Helpful Tips in Running a Fair

There are many ways to organize judging.

Judge by tables. Judging time can get quite long for students as they wait for judges to come to their projects. Have the judges interview one row of tables at a time, and tell the students in the next row of tables they are “on deck.” (not in the fair site, but close by) Other students are free until they are “on deck.”

As soon as the first row of tables has been judged, those students are dismissed and the second row of students come into the fair site to be judged. The students whose projects are on the third row are now “on deck.” All other students can be occupied

with board games, or other organized activities. This keeps students from having to stand by their projects for three hours until the last projects are judged.

It also helps to organize tables by category: experiments, observations and collections. This helps judges focus on the appropriate scoring rubrics.

Students come to project when summoned. This sounds a bit disorganized, but if all students are in the gym away from their projects, judges can call when the student(s) are next. This works well as long as students have not vacated the gym.

It is not realistic to expect all students to stand by the projects for long periods of time waiting for judges to come to them. The long, long wait has turned many students off to science fairs and projects. They say, “Boring” and it is.

Practice. After the students have setup their projects, but before the judges come to interview them, allow the students to practice on each other by doing the following:

- Divide the students into two groups, the presenters and the interviewers. Give each a piece of paper with 1 or 2 on it. Counting off 1,2,1,2... doesn't work!
- Presenters stand by their projects and interviewers spread out in front of the presenters. At a signal, the presenters share their project with the interviewers for 3-5 minutes, when the time is up, the interviewers rotate to another project.
- After this is done several times, presenters and interviewers switch positions. The rotating begins again.
- This gives each student the opportunity to share his/her project to peers several times before talking to the judges. It works *great* to kill “butterflies.”

If students aren't listening to directions, it can get a bit crazy, but the potential positive results are worth the risk.

Unattended projects. Upon occasion, schools have sent projects without the students. Those projects seldom win high honors, but their presence contributes to the fair. Now that we are using video presentations and Skype over the internet, it is possible for judges to talk live to students who are not physically present.

Interaction. If the fair is held in a larger city, groups quickly split off to do shopping or go to movies during

free time. Group ice breakers are the quickest way to initiate interaction among fair participants. Students should know how to introduce themselves in a group, giving their name, Native name (if he/she has one), name of their parents and town/village.

Teachers and chaperones have felt the need for more meaningful interaction among the students, developing long-term, statewide, peer relationships. The relationships will serve as a support system in college and later endeavors. While “icebreakers” seem awkward at times, they accomplish in a few minutes what might take days otherwise. Field trips or other large group activities as well as staying in the same location and sharing transportation all contribute to a sense of community. In the past, during the State Fair, we have hired professionals to do team/peer building activities with excellent results. Students come away with a sense of connectedness to other students from across the State.

Consider a stipend for both sets of judges, or at least a gift of appreciation.

Future Fairs

Once COSEE explores the possibilities of a cyber fair, and works out the details, it wouldn't be surprising to if a Circumpolar Fair emerged with competitors from Russia, Greenland, Canada, Norway etc. This has been the dream since 2002.