

Science Fair Project Guidelines

This document contains suggestions, guidelines, and resources that may be helpful as you lead the Alaska Native Ways of Knowing lesson. Depending on your teaching style, student ages, time, and resources, you may opt for a more or less explicit approach to developing science fair project ideas, communicating objectives, and organizing the fair itself. Please review and use as is appropriate to your needs.

Tips for helping students select science fair projects

For this activity, classroom science fair projects should focus on Earth science topics relevant to local community concerns, such as climate change, oceans, rivers, tundra and vegetation changes, local weather, local geology, petroleum, and mining, as well as Alaska Native ways of knowing related to specific environmental and health topics. You may help students identify and prepare their science projects in a classroom setting. You may also consider an extended field trip or camp experience in the community during which they can complete their projects. Detailed guidelines for a camp-based approach with a cultural theme are outlined in the first chapter of the Alaska Science Camps, Fairs & Experiments: http://ankn.uaf.edu/Alaska_Science/ (PDF resource.)

Project ideas with both scientific content and cultural relevance may center on such topics as:

- Cloud formations and how these can help predict the weather
- Collections of local rocks and minerals and how they are used both traditionally and presently
- Analysis of permafrost, including its soil components, temperature measurements at different depths, and depth

Note: These are just a few suggestions. Additional ideas may be found in the media resources featured in the main body of the lesson plan. For younger students in particular, you may choose to narrow their choices to a few options. If students want to choose a subject outside a given list, they may submit a proposal to do so.

Preparation and presentation of projects

Science fair projects often follow a strict format that includes making a hypothesis or prediction, designing an experiment or investigation, collecting and analyzing data, and drawing a conclusion. However, understanding that Alaska Native ways of knowing is practiced differently, you may want to adjust these requirements. For example, the element of data collection may still be a feature in the project. Students may determine whether data collection is done quantitatively in the Western tradition, or based on historical and cultural understanding in the Alaska Native tradition.

Judging the projects

Several resources offer criteria that may be used for judging projects. However, just as the format of the projects should allow for some flexibility, so should the judging criteria. Because the process of completing a science fair project holds as much value as the final product, judges should consider whether the project demonstrates understanding on the part of the student or team, as well as how effectively the main idea is communicated in the poster.

Following are some ideas adapted from two of the DVDs featured in the lesson plan, *Science Fairs Are Fun* and *To Show What We Know* available at the Alaska Native Knowledge Network: <http://ankn.uaf.edu/media/>. You, the teacher, should refine these ideas to meet your needs and available resources.

General judging guidelines:

- Projects should be judged on both scientific and cultural content.
- Science evaluators, which may include science teachers or qualified community professionals, should score projects based on the application of the Western scientific way of knowing; the clarity of the problem statement or investigation question; the hypothesis or prediction; and the attention to good experimental design, data collection, analysis, and results or conclusions. Cultural evaluators, which may include Alaska Native Elders, should score projects on the basis of how well the student demonstrates an understanding of the cultural teachings about the subject, tells a story that relays relevant information, uses relevant visual aids (photographs, etc.), relates the topic to Alaska Native values, and makes a contribution to their community. Additional points should be given to the student who demonstrates competent use of observation skills in securing information experientially.
- Students will be expected to explain projects in detail, provide demonstrations if asked, and answer questions from judges in interview settings with both Alaska Native and Western evaluators. Judges should be coached to do this in a friendly, non-confrontational manner. If possible, provide practice opportunities to help judges apply scientific and cultural guidelines consistently across all types of projects.
- Important: Encouragement will provide a more positive influence on students than criticism alone and may, in turn, foster their enthusiasm for further learning.

General advice for engaging with students

Here are some tips teachers and judges may adopt when they engage with students:

1. Help students choose and develop their project choices and get them excited about the possibilities.
2. Break down and teach the component skills of the process.
3. During the final evaluation, provide positive feedback to let students know when they're doing a good job.