Kivalliq Science Educators' Community

Science Fair Primer

A joint publication by
Kivalliq School Operations and
The Kivalliq Science Educators' Community

Acknowledgements

This document was pulled together from a number of key resources available in print and on-line. In particular, the Kivalliq Science Educators' Community acknowledges and is indebted to the following resources:

1. Access Excellence @ National Health Museum
   http://www.accessexcellence.org/LC/TL/scifair/

2. Baker Lake Science Fair—Teacher Support Package
   Bill Cooper, Jonah Amitnaaq School, Baker Lake, Nunavut, 2004

3. From Idea to Exhibit: A Guide to Science Projects for Teachers, Students and Parents
   Youth Science Foundation,

4. Greater San Diego Science and Engineering Fair Web site.
   http://www.gsdsef.org/

5. Helpful Tips for Running Your School Science Fair
   Tanya Connors, Kitikmeot Sch. Operations, Nunavut Dept. of Education, Kugluktuk, 2006

6. Nunavut Historica Fairs Program
   Amy Bartlett, Curriculum and School Services, Nunavut Dept. of Education, Arviat, 2006

7. Supporting Student Science Fair Projects
   Bay Area Science and Engineering Fair (BASEF) Nicola Simmons
   http://basef.mcmaster.ca

8. University of New Mexico Science Outreach Programs
   http://stemed.unm.edu/Timeline.aspx

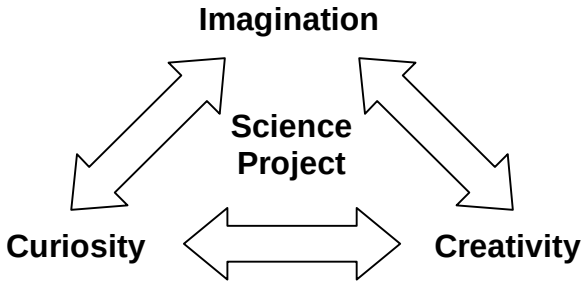
9. What are Science Fairs?: An Information Bulletin for Teachers
   Northwest Territories Department of Education, Yellowknife, 1990.

10. Youth Science Foundation Canada
    http://www.ysf.ca/

2007 KRSF Logo—Rankin Inlet

Preface

Curiosity exists naturally in everyone, but if untapped it can become buried with age. Science and independent investigation can indulge this curiosity in a student. A healthy curiosity provides a capacity to imagine and imagination is the pre-curser to creativity. Curiosity, imagination, and creativity form the foundations of science and can all be nurtured through the development of a school science project



This primer was developed to support Kivalliq Secondary School Teachers to facilitate the development of science enquiry through student projects. In particular, it provides the necessary information to initiate student science projects and coordinate a school science fair. As well it provides details on the Kivalliq Regional Science and Canada-Wide Science Fair programs.

As a teacher who facilitates the development of student science projects, you will wear many hats including mentor, manager, and motivator. It is exhausting work, but well worth it in the end. Students' gain general and scientific knowledge, skills, and attitudes through their development of science projects that will serve them throughout their lives and possibly lead them down a career path related to science and technology. However, regardless of their career choice, the world is in dire need of their curiosity, their imagination, and their creativity.

Jim Kreuger
President—Kivalliq Science Educators' Community
Baker Lake, NU
January/2008

Table of Contents

Introduction

Science is a verb as well as a noun

As teachers, we know that students are the focus of education. Each student starts at a different place and learns at a different rate. Classrooms display a great variety of student interest and ability. Teaching is often akin to taking a group on a long trek. As the guide you need to meet the group where they are and lead them towards the destination—the path you choose may not always be the most direct route.

1999 Kivalliq Regional Science Fair—Repulse Bay

Science is both a product and a process; a noun as well as a verb. In many classrooms science is presented as only a noun, a product, a compendium of facts. However, science is also a process that can be easily unleashed through the inquiry of student investigation and science projects. Within the parameters of a projects, students can become their own guide and learn to teach themselves. Students are interested in the world around them and science is a process that is powered by such curiosity.

Why Bother with Science Projects?

A Science Fair has the potential to attain many goals for both the participant and the school at large. The following list provides some of the main possibilities:

For the School, Science Projects…

- ✔ Provide an opportunity for student-directed learning.
- ✔ Accommodate a great variety of student abilities and learning styles.
- ✔ Bridge the school–community gap. Science Fairs create a venue for school and community to meet and celebrate student work and success.
- ✔ Establish a legacy of student excellence.

For the Student Participant, a Science Fair…

- ✔ Provides an opportunity to study topics of interest through a hands-on approach.
- ✔ Develops an understanding of science as process as well as a product
- ✔ Develops a sense of accomplishment self-esteem for students who complete a project.
- ✔ Develops science skills and knowledge.
- ✔ Provides an opportunity to find the answers to their own questions.

- ✔ Develops writing and oral presentations skills
- ✔ Employs mathematical and analytical skills
- ✔ Creates an opportunity to learn and have fun learning outside of the classroom.
- ✔ Develops artistic skills.
- ✔ Provides an opportunity to develop an idea from conception to completion and work to a deadline.

Where Can I Find the Time?
In the Kivalliq, teachers support and manage Science Projects in a number of ways that very greatly in the amount of structure provided by the school.

In-Class Science Projects
Many schools integrate student projects into the Junior and Senior High School Science programs. In this model, all students complete a project alone or as part of a group. Some class time is provided for project research and development and student work is graded and included with other assessment to make up their report card grade in science. This model provides the most support to the students who need it most and yields the most projects, but also utilizes valuable classroom time.

Extra-curricular Projects
Some schools decide to make science fair projects an optional extra-curricular student activity. This model is especially prevalent with senior high schools, where extensive curricula and departmental exams demand every classroom hour. Science clubs offer the support to students who do most of the work on their own time after school. This model is appealing to the more motivated students but does not offer enough support for average students. As a result, projects may be of excellent quality, but will be fewer in number.

Steps to a Successful Project
Science Fair projects can become overwhelming if not structured and supported by teacher-mentors. It is important to have your students start work on their projects as soon as possible; too much time is never considered to be a problem. Encourage students to be creative, natural, honest, personal, and original. Also encourage them to create bilingual projects (English and Inuktitut) on topics relevant to their lives. Students may prepare their projects as individuals, in groups or as a class. However, projects that are eligible for the Kivalliq Regional Science Fair may have no more than two participants working on them.

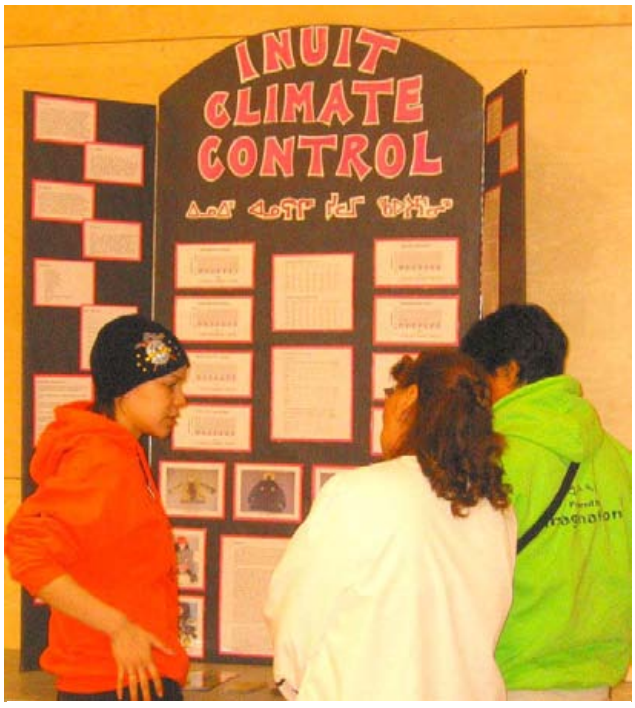
Have students begin a project logbook and record all stages of their work. Logbooks contain all rough work, plans and records, everything should be recorded in the logbook with date annotations. Logbook are not finished presentations. They are a record of the student's work and progress and are the starting point of the project and the reference for both the project display and report. It is more important for a logbook to be complete than to be neat and tidy.

Time-management and motivation are two key supports that teachers need to provide

their students in the Kivalliq. Here are seven basic steps to get your students started on their project work.

1. Problem:
   Ask a question which can be answered by research, observation, experimentation and/or creating new invention.
2. Hypothesis:
   State your hypothesis. Students will predict what the outcome will be based on the students' experiences and/or information collected from available resources.
3. Procedure:
   A Material: List every item which is needed to do the experiment, study or innovation. Include equipment as well as materials.
   B Method: List a step-by-step sequence of exactly what your plan is.

4. Results:
   In your logbook, record your observations and/or results. Note any accidents, mistakes, unusual or unexpected observations Develop graphs and/or charts to present your data.
5. Conclusion:
   Using the data from your results, answer the question asked in Part 1. Then, note any additional comments, explanations of why the results did or did not match your hypothesis. Also note any information, which you learned from your research that would be relevant (include a Bibliography).
6. Report:
   Write a report to summarize your project and results. Include a bibliography and acknowledgements section. Your report should contain all relevant information regarding your project.
7. Display Exhibit
   Develop a display to present your project and results. Displays should be attractive and easy to read and understand and contain information from steps 1-5. Your exhibit may not be able to display everything that is in your report, but should contain the main points.



2005 Kivalliq Regional Science Fair—Baker lake

Project Summary Sheet

Student Name:_____ Date:_____

Record the decisions you have made so far on this page

My science fair topic is: _____

My question is: _____

My hypothesis is: _____

My project will be: ❑ an experiment, ❑ an innovation, ❑ a study

Books I have read:. _____

_____

Websites I have visited: _____

_____

Experts/Elders I have spoken to: _____

_____

Interesting things I found in my resource research: _____

_____

Safety regulations for my project are: _____

_____

Equipment I need: _____

_____

Ethics guidelines for my project are: _____

_____

Project Management: See attached timeline

An Eight-Week Project Timeline
Set timelines to allow enough time for your students to make revisions and corrections. The unexpected can happen, so plan for more time than you think you'll need for each stage. For example, always plan for your students to finish their final display at least one week before the fair. They will be glad of the time to practice answering questions as and explain it to family and friends! Assign due dates for the different stages in the project. For example, you may be expect your students to have their library research done by a certain date, and all their experiments or design innovations completed by another date that will still allow them time to prepare their final presentation

The following timeline provides a basic student outline for a science project from start to finish. Please note that the exact amount of time needed to complete a science fair project varies widely. This plan is based on the **very least** amount of time recommended for project completion.

Week 1
Think about possible project ideas. Talk with your teachers, friends, and family about your project. Choose a specific project topic. Write a description of what you want your project to involve. Obtain a Project Summary Sheet from your teacher and begin to fill it out.

Week 2
Develop your topic. Collect information regarding your topic. Conduct detailed research regarding your topic, making sure to take sufficient notes. Record all sources of information that you obtain research from. Formulate specific procedures for your project and begin experimentation.

Week 3
Continue your experiments. Conduct many tests in order to ensure that your results are accurate. Carefully record your experiments. Make appointments to talk with resource people (those who may be able to help you with your ideas).

Weeks 4 & 5
Continue your experiments. Prepare an outline for your report. Write a rough draft of what you have done and learned in the course of your experiment.

Week 6
Write your final report. Begin work on your project exhibit.

Weeks 7 & 8
Finish your project exhibit. Practice presenting to your family, friends, and class.

Inuit Qaujimajatuqangit Principles and Science Fairs

Inuit Qaujimajatuqangit (IQ) Principles common essential leanings or core values of Inuit culture. The IQ Principles were developed by elders and adopted by the Nunavut Government as guiding principles. KSEC believes that science projects and fairs promote many of the eight IQ principles. In particular, Science Fairs can reinforce:

- *Innuqatigiitsiarniq*- the concept respecting others, relationships and caring for people. Group work and having fun together is part of every Science Fair.
- *Tunnganarniq*- the concept of fostering good spirit by being open, welcoming and inclusive. Science Fair challenge events are fun and create good will among the participants. KSEC has created the *Tunnganarniq Peer Award* for the student attending the Kivalliq Regional Science, who, in the eyes of his or her peers, best exemplifies this principle.
- *Piliriqatigiingniq*- the concept of developing a collaborative relationships and working together for a common purpose. Most science projects are done by groups of students working together collaboratively.
- *Avatimik kamattiarniq*- the concept of environmental stewardship stresses the key relationship Inuit have with their environment and with the world in which they live. Science Fair events attempt to utilize recycled materials, such as cardboard, cans and bottles.
- *Pilimmaksarniq*- the concept of skills and knowledge acquisition and capacity building is central to the success of Inuit in a challenging environment. Learning by doing is a pedagogical technique that brings the traditional into the contemporary and is essential to the knowledge construction that occur during the research and development of science projects.
- *Qanuqtuurniq*- the concept of being resourceful to seek solutions by maximizing utilization of limited resources and improvising when and where necessary. Resourcefulness is probably the strongest IQ value embedded in the Science Fair program. Participants must be resourceful to create a project. KSEC has established the *Thomas Kudloo Memorial Qanuqtuurniq* Award for the project that relates to the north and Nunavut and show great resourcefulness. It is awarded annually at the Kivalliq Regional science Fair
- *Aajiqatigiingniq*- the concept of consensus decision-making relies on strong communication skills and a strong belief in shared goals. Completion of a science fair project requires many decisions that all members of the group must support. Communication of a share goal is a key element in the interview portion of the judging process.
- *Pijitsirarniq*- the concept of serving and community as opposed to pure self-interest. Working in pairs or in groups helps participants see beyond themselves. Science Fairs utilize this teamwork approach.

Historica Fairs
The Department of Education facilitates the Nunavut Historica Fairs Program for Nunavut schools. They produce a Teachers Handbook that describes the Historica guidelines and the steps for organizing a Local Historica Fair as well as preparation for and participation in the Territorial Historlca Fair, the National Fair, and the Virtual Historica Fair. The Historica Fair Program is open to Nunavut students in Grades 4-9.

All participating schools and the Historica Fair Team participate in a conference call once a month over the year to provide guidance and answer questions.Each school holds a Local Fair sometime between October and March. The two best projects from each Local Fair are selected to proceed to the Nunavut Territorial Historica Fair.

The Territorial Historica Fair is held the first week of May. It consists of a website located at www.ecss.nu.calhlstorica where the students' projects are displayed. Judges from across Nunavut visit the site and rank the projects. The Nunavut delegation to the National Historica Fair is decided in collaboration with the teachers of the students who submitted the top-ranking projects. The National Fair is held the second week in July in a different location in Canada each year. Students from each province and territory come together for a week of activities and celebrations culminating in the National Historica Fair. For more information on Historica Fairs, contact the Department of Curriculum and School Services in Arviat.

Historica Fairs Project & Science Fair Projects
Many topics that are suitable for Historica Fair Projects are also suitable for science projects and with a some tweaking and some additional work a student my be able to enter his or her project in both programs. A study of an Inuit technology is an example of a topic suitable for both programs.

Types of Science Projects
The Canada-Wide Science Fair groups projects into three main categories: experiments, studies and innovations. The process of completing each is similar, but there are some differences you will need to understand. On the next page the three types are outlined, and examples of each are given.

Experiment:
Investigations are undertaken to test one or more hypotheses. An experiment is a science project that uses a process of scientific inquiry to investigate the question. You would think of a question about a topic, make a hypothesis (educated guess based on your existing knowledge or by reading) regarding the answer, and then design and conduct an experiment to test that hypothesis. You will make, record, and analyze observations to accept or reject your hypothesis. The key to a good experiment is identification and control of the variables.

Example: You might be interested in sewing qammiks and have a question' about which is stronger synthetic or natural sinew, or you might want to know whether thinking generates heat.

Study:
A collection and analysis of data showing evidence of a correlation, situation or pattern of scientific interest. Variables are identified and controlled where possible. A study is a project in which observations are made about an existing phenomenon and results are recorded. Instead of controlling and changing the variables, you would choose existing or naturally occurring variables for observation. Your focus is on finding a (new) explanation for the recorded observations. This type of project can also be a purely literature-researched based project in which you compare work of several others in a field and look for relationships that they may have missed. This is a less common type of project, but if done well, is certainly as strong as the experiment or innovation.

Example: You might be interested in how darkness affects student attendance at school or traffic at the health centre. You might want to do a library search and interview elders to see if there are climate changes occurring in your region.

Innovation:
The development and evaluation of models or innovative devices (inventions), using techniques or approaches from the field of technology, engineering or computers. An innovation is a project in which you design a product that solves a particular problem. You would identify a problem, and experiment with materials to design a solution. You would conduct trials to test the product, and improvements in design are made to better meet the needs of the original problem.

Example: You might like building models, and might want to choose to design something that solves a particular problem, such as how keep your home's stink pipe from freezing up in the winter time or how to prevent a snow machine's fuel pump from freezing up.
KSEC has adopted these same categories for the Kivalliq Regional Science Fair and encourages schools to use the same designation. KSEC also encourages students to develop projects that are relevant to the north and Nunavut and rewards such projects in the judging process. Bilingual (English and Inuktitut) projects also receive additional marks in the judging process at the Kivalliq Regional Science Fair (see pages 23-25).

What Makes a Good Science Fair Project?
First and foremost, a good project must be on a topic that interests its developer. There is no substitute for the enthusiasm that results from interest and curiosity. The following list describes the characteristics of award-winning projects.

- ✓ A clear statement of the question asked. A clear statement of what the student feels the answer to the question will be - and why!!
- ✓ An outline of the experimental design - material needed, variables involved, controls implemented.
- ✓ A summary of experimental results.
- ✓ An attempt to explain the results, and what they mean in relation to the original question and the student's prediction.

- ✓ An eye-catching display exhibit that communicates the essential elements of the project in a clear and concise manner
- ✓ A logbook that contains date annotated planning notes and results of the project's history.
- ✓ A well-written report that summarizes the project and its results.

The Written Report (see page 22 for Report Rubric)
The report should communicate the student's work to their teacher, classmates, judges, and others who may come to the fair. A sign of an excellent report is one that someone else could use to repeat the project. The report needs to be clearly written, in a logical sequence, with all steps in clearly explained. This written work should tell a story about the student's observations, and should include the following:

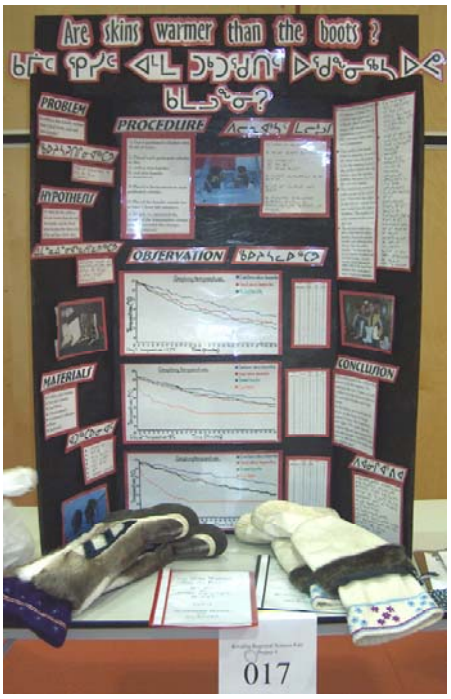
- ✓ A title page with project name and student's name
- ✓ An abstract of the project (brief summary of the entire project-- Title/Problem/ Purpose of Project/Hypothesis/Procedure/Conclusions in 50-200 words)
- ✓ A table of contents
- ✓ Introduction
- ✓ The question/problem statement, purpose, and hypothesis
- ✓ Background information, written in student's own words
- ✓ The procedure, including the materials list (include diagrams or photographs)
- ✓ Summaries of all experiments/tests
- ✓ A summary of all data collected (tables, graphs, etc)
- ✓ Student's conclusions about the results
- ✓ A discussion of the possible applications of the project
- ✓ A reference list
- ✓ Acknowledgements

In addition, an appendix section may be included, which could contain:

- ✓ Any required forms, for example, ethics committee approval forms
- ✓ Copies of blank questionnaires used in your project
- ✓ Additional relevant photographs

The student's original logbook (journal) should also be submitted as a separate book.

The Display Exhibit
The purpose of a display is to communicate the summary of student's work and results in an eye-catching manner. Attention paid to colour and font size of the text is vital to the overall appeal. A common mistake is to overload the display with far too much detail and text. The display information should not be



2006 KRSF—Whale Cove

the same as what is in your written report. Rather, it should just be the highlights of the science project.

Items that must be included in a project display are:
- ✓ Your question/problem statement
- ✓ Your hypothesis
- ✓ A summary of your results
- ✓ The booklet of your written report
- ✓ Your original logbook

Optional Items that may be included in a project display are:
- ✓ Graphs or charts summarizing your results
- ✓ Models, drawings, photographs
- ✓ Materials to demonstrate your project (if allowed under safety guidelines)
- ✓

Items that should not be included in a project display are:
- ✓ Other references such as books, website pages. A student summary is preferred.
- ✓ Any substances on the prohibited list. Consider photographs instead.
- ✓ Anything irreplaceable. Students and teachers should think carefully about security and possible damage before putting expensive equipment on display.

Judging Criteria

The process for judging a science project will depend, to large degree, on the expectations that you communicated to your students and whether or not there is a competition aspect to the Science Fair. In-class projects also carry the additional responsibility of providing input into the students report card mark in science. In any case it is a good idea to share evaluation rubrics and judging booklets with your students at the onset of project work so they know exactly what the expectations are. Judging is usually broken up into two parts; Project Display and Report and Student Interview. Remember this process should be viewed as an opportunity to provide positive feedback to the students.

The Kivalliq Regional Science Fair Report Rubric and Project judging booklet may be found on pages 22-25. Some of the main criteria for judging are as follows:

Scientific Thought
- Has the problem been stated clearly?
- Was there an effective plan for obtaining a solution?
- Does the project carry out its purposes to completion within the scope of the original plan?
- If controls were necessary, was there a recognition of their needs, and were they correctly used?
- Are the variables clearly recognized and defined?
- Are there adequate data to support the conclusions? Were the experimental errors inherent in the measurements made and in the materials used recognized?

Originality
- Is the problem original?
- Is the approach to solving the problem original?
- Does the interpretation of the data show originality?
- Has the equipment been used in an original way?
- Is the construction or design of the equipment original?

Skill
- Does the student have the skills required to do all the work necessary to obtain the data that supports his project?
- Did the student build the equipment himself?
- Has the student made skillful use of the information facilities available?
- Has the student shown an adequate scientific vocabulary related to his problem?
- Is the workmanship on the exhibit neat and well done?

Dramatic Value
- How attractive is the exhibit?
- Does the exhibit successfully incorporate a multi-sensory approach?
- How well does the display explain itself?

Report and Logbook (optional for lower grades)
- Has all the required information been provided within the specified guidelines?
- Has the student expressed himself well in written material? How much of the written material was prepared with assistance of other persons?
- Are the important phases of the project presented in an orderly manner in the report?
- How comprehensive is the logbook?

Student Interviews

With patience and understanding, interviewing students can be a most rewarding activity. Most students (even shy ones) do enjoy the attention that results from someone showing interest in their work and asking questions about it. Prepare you're your students by having them practice interviews with family and friends before the project is judged at school. The following are some common interview questions that judges like to ask.

- Why did you choose this topic for a project?
- How much time did you spend working on this project?
- What was the biggest surprise in your work?
- What did you find out that you didn't expect?
- What do you think would happen if you changed (a variable)?
- What further work would you have done if you'd had more time?
- If you were to do this project again, what would you do differently?
- Tell me something that's not obvious from your backboard.

School/Community Science Fairs

Most of the Kivalliq Region's twelve schools organize a local science fair each year. The Kivalliq Science Educators Community has supported these endeavours by a creating a regional event for school winners, aged twelve to twenty-one to attend. The Kivalliq Science Educators Community has also provided support to schools in the form of project ideas and resources such as this primer.

Hosting a School/Community Science Fair

Deciding to host a school/community science fair is a huge undertaking that requires a teacher-chairperson and a legion of volunteer committee members to share the load. Going it alone may be possible but it is also a recipe for "burnout". The following checklist is intended to help teachers organize a committee to plan, fund, and host a school/community science fair.

- ✓ Recruit volunteers to form your committee
  - Consider everyone you know! (Other Teachers, SSA's, SSTs, Parents, Community 'Members)

- ✓ Prepare at budget
  - Be realistic and gear budget towards fundraising potential. It is better to scale down a fair than to struggle under the burden of over ambitious fundraising targets.

- ✓ Host a meeting to create a work plan and timeline.
  - Choose a date!
  - Fundraising goals (proposal letters)
  - Judges and judging (forms, volunteer judges, inservice, snacks)
  - Awards and certificates
  - Community engagement (science show, scavenger hunt, science challenge)
  - Logistics (venue, public viewing, class viewing)
  - Fair Program (awards ceremony, MC, Mayor)
  - Advertising and promotion
  - Thank yous

- ✓ Delegate duties to volunteers
  - It is better to be directive than to take on too much yourself.

- ✓ Get excited and Get Started!

Fundraising Proposal Template

Date

Potential Funder
Box 25
Moneybag, NU

Re: Science Fair Funding Request

Dear Sir or Madam:

I am writing to you today to request your support in funding our school community science fair. Several students from K-12 will have the opportunity to explore, share, and learn new science themes through participation in this fair. We live in an increasingly complex world that relies heavily on science and technology and many career opportunities require pre-requisite science knowledge and skills. Events like our science fair help to promote science in a fun and interactive way.

Funding will be used for prizes, certificates, and snacks for judges and participants. Any monetary donation or prizes you may be able to donate will be appreciated.

I hope that you will see the importance of this event and its role in the development of youth in our community and be in a position to support it.

Thank you for your consideration.

Sincerely,

Science Fair Committee
Your Community School

Parent’s Letter Template

Date

Dear Parents/Guardians,

Your child is involved in developing a science fair project. Science fair projects present an exciting challenge that many students haven't previously experienced. The work introduces students to the use of many of the methods of scientific investigation.

The students have been given several handouts to help them with the development of their projects. Also be aware of safety considerations so that your child is not exposed to any dangerous chemicals, electrical hazards, or other potential dangers, in the development of their project.

A lot of work is required to complete a high quality project. Your support is welcomed but, should not extend to the point where you are doing a lot of the work. Support is most valuable when you can encourage, suggest, and help in accessing research information, and the various materials needed to develop the project. Assistance in checking spelling and good grammar are welcomed. Your child must solve most of the problems associated with the development of his/her project, otherwise little science will be learned. Your typing, over editing, illustrating, and experimenting are unnecessary, and will detract from your child's learning.

Success is measured by how much is learned during the process of developing a project, rather than by how many ribbons or trophies are won. Periodically please look over your child's project as it develops, and after referring to the information provided, discuss areas for improvement.

Thank-you very much for your assistance and support.

Sincerely,

Our school science fair will be held on _____

For further information please phone me at _____

Kivalliq Regional Science Fair

Year	Location	Students
1994	Rankin Inlet	20
1995	Baker Lake	28
1996	Coral Harbour	32
1997	Arviat	30
1998	Baker Lake	30
1999	Repulse Bay	30
2000	Rankin Inlet	30
2001	Baker Lake	30
2002	Arviat	30
2003	Repulse Bay	30
2004	Chesterfield Inlet	34
2005	Baker Lake	30
2006	Whale Cove	30
2007	Rankin Inlet	34
2008	Arviat	

The Kivalliq Regional Science Fair brings together students from each Kivalliq community to display their science projects, exchange ideas, and compete for the privilege of representing the region at the Canada-Wide Science Fair. Although competition and judging are components, the Kivalliq Regional Science Fair is much more. Science challenges, career education presentations, and hands-on science and cultural activities, as well as social events like a dance and banquet, keep the participants active. Public science show, land trip, science workshops, team challenges and the cardboard qamutik challenge are but a few examples of Regional Science Fair activities. The Kivalliq Regional Science Fair is held in March in a different Kivalliq community each year. This has helped to raise the profile of the event and science in the region.

2005 Kivalliq Regional Science Fair—Baker Lake

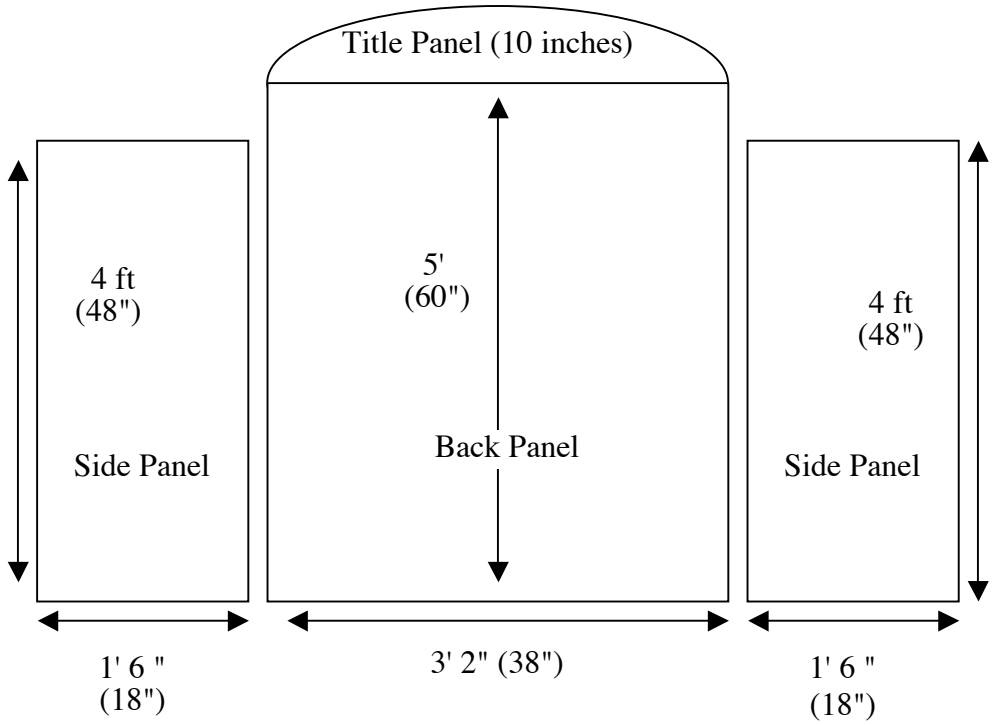
Fees and Quotas

The Kivalliq Regional Science Fair is open top all Kivalliq secondary schools (grades 7-12). Each eligible school may send up to four participants and one teacher. The host school may include an additional two projects in the competition (up to 4 additional students). The participation fees for the Kivalliq Regional Science Fair are set at $650 per school, payable to the Kivalliq Science Educators' Community. Registration fees must be paid on or before the date of the Kivalliq Regional Science Fair.

School	Community	Delegation	Fees
Sakku School	Coral Harbour	4 students + 1 teacher	$650
Tusarvik School	Repulse Bay	4 students + 1 teacher	$650
Maani Ulujuk Ilinarvik	Rankin Inlet	4 students + 1 teacher	$650
Jonah Amitnaaq Sec School	Baker Lake	4 students + 1 teacher	$650
Victor Sammurtok School	Chesterfield Inlet	4 students + 1 teacher	$650
Inuglak School	Whale Cove	4 students + 1 teacher	$650
Qitiqliq Middle School	Arviat	4 students + 1 teacher	$650
John Arnaladjuak School	Arviat	4 students + 1 teacher	$650
Host School	Varies	4 students + 1 teacher • an additional two projects to a maximum of 4 additional students • an additional teacher	$650

Project Displays

In 2007, KSEC adopted a standardized science fair project display board (see below). Schools hosting the Kivalliq Regional Science Fair are funded by KSEC to construct 20 - 25 such display boards for use by the participants. This decision has eliminated the need to ship costly displays in advance of the event. Student participants need only bring their display materials and affix them to the boards upon arrival. The host school may keep the display boards after the fair is complete.



Program

The Kivalliq Regional Science Fair traditionally runs over a weekend, from Friday to Monday. It is packed with activities that keep participants engaged and interacting with each other throughout the weekend.. These events included:

- Public Science Show
- Youth Dance and/or movie
- Open house and public viewing of the projects
- Science Workshops
- Land Trip
- Cardboard Qamutiq Competition
- Team Challenges
- Awards Banquet

2006 KRSF Science Show and Cardboard Qamutik Challenge—Whale Cove

An outline of a typical schedule for a Kivalliq Regional Science may be found below.

Typical Kivalliq Regional Science Fair Schedule (Actual schedule for a specific fair may vary)				
Time	Friday	Saturday	Sunday	Monday
7:30		Wake-up	Wake-up	Wake-up and vacate classroom
8:00		Breakfast & Clean-up	Breakfast & Clean-up	Breakfast & Clean-up
9:00		Judging (without students) Student Workshops	Team Challenges	Student Activity/workshop until departure time
12:00		Lunch & Clean-up	Lunch & Clean-up	Lunch (if necessary)
1:30		Judging (with students) KSEC Meeting	Land Trip	Depart for home community
5:30	Supper	Supper & Clean-up	Awards Banquet	
7:00	Arrive at school Set up Projects Snack Student Activity Project Leveling	Public Viewing Science Show Snack and a Movie	Team Sports Challenge	
11:00-11:30	Lights Out	Lights Out	Lights out	

Packing List

A school in a Kivalliq community hosts the Kivalliq Regional Science Fair. Students and teachers will be billeted in classrooms on gym mats. The following items are necessary for participants to enjoy themselves.

- ☐ Sleeping Bag
- ☐ Toiletries (soap, shampoo, towel, tooth brush, tooth paste, hairbrush)
- ☐ Winter clothes for the land, parka, mitts, hat, kamiks or boots, sunglasses, wind pants.
- ☐ Clothes, pajama's
- ☐ Indoor shoes (for sports)
- ☐ Science Fair Project and Display
- ☐ Bring a creative non-traditional utensil to eat soup with. Most creative utensil will win 10 points for their team.
- ☐ Bring your teacher, don't lose him or her in the airport.

1999—Teachers' Cardboard Qamutik Entry

Judging

The Kivalliq Regional Science Fair utilizes a modified Canada-Wide Science Fair Judging booklet (see pages). Noted modifications include:

- ✓ Part A Display: Bilingual Elements—Project Displays that are presented in English and Inuktitut earn additional 5 marks
- ✓ Part C Scientific Thought—Levels 4 and 5 have been compressed into one level
- ✓ Part E: Northern Relevancy—Projects that are relevant (culturally, geographically, socially, etc) earn addition 5 marks.

Pre-Leveling

After projects have been set up and before judging begins, the teachers, led by a KSEC Executive member, reviews all of the projects and assigns a level of "Scientific Thought". This process is one of consensus and helps to ensure that projects are judged on more than their displays. Once a level has been assigned to a project, the Part C of the judging booklets for that project are edited to restrict the maximum and minimum marks to that of the assigned level. Note: that it is common for a project to be assigned an intermediary level such as 1.5 or 2.5.

Reports and Log Books

Judging at the Kivalliq Regional Science Fair is a full day activity that can be overwhelming to many. To reduce the risk of overburdening the Judges on the during the Kivalliq Regional Science Fair, project reports and log books must be sent to the host school at least one week before the event so that they may be read and evaluated before the students and displays arrive. Reports and logbooks are evaluated using the rubric found on page .and this mark is transferred to the Judging Booklet as Part B. Note that the same individuals who judge the projects on the day of the fair may not necessarily judge the reports.

Judging at the Fair

Judging takes place on the Saturday of the Fair and is broken up into two sessions, morning and afternoon. During the morning session, the judges focus on Part A: The Displays. Students are not present during this session. The afternoon session focuses on interviews (Part D) and Northern Relevancy (Part E). Students are present and should be encouraged to interact with the judges and demonstrate their understanding of their projects.

2006 Kivalliq Regional Science Fair—Whale Cove

Judges

The Kivalliq Regional Science Fair strives to provide qualified judges with skills necessary to positive feedback to the students and evaluate the projects. Bilingual judges are ideal, as are judges with a background in science. However, the most important qualities in a judge are genuine interest, patience, and willingness to listen and learn from the students. Most Regional Science Fairs provide 8-12 judges, who judge alone or in groups of two.

Head Judge

The Head Judge of the Kivalliq Regional Science Fair is often an individual of stature in the community or region who has a background in Science, Science Fairs, or Evaluation. The role of the Head Judge is to check oversee the judging process, check over the judging booklets, convert the results for each judge into ordinal rankings and rank the top 3-5 projects. These results will be verified and authorized by a panel made up of the Chief Judge, the Science Fair Chairperson, and the senior ranking KSEC Executive member. The Head Judge will also be asked to represent the judges at the award banquet and assist in the presentation of the top awards.

1997 Kivalliq Regional Science Fair—Qitiqliq School

Awards and Prizes

All participants at the Kivalliq Regional Science Fair are given various items of swag. Although the items vary from year to year, typical swag includes a hat, tee-shirt or hoodie, and a backpack.

At the awards ceremony, each participant receives a certificate and a KESC Medal. Certificates are crafted specifically for the individual participant(s) listing their project title and merit.

The results of the judging will be made known to the teachers (who are sworn to secrecy) on Saturday evening so that a meeting may be held to assign the awards and prizes. The Judging process will have resulted in a ranking of 1st to 3rd, 4th , or 5th. The delegation to the Canada-Wide Fair should come from the 1st place project, then the 2nd place project, and so on until the three places are filled. The teacher panel must decide with project wins the other awards and should identify categories to recognize the remaining projects. For example, Top Chemistry Project, Best Environmental Project, etc. These distinctions will be added to the certificates presented at the awards banquet.

The Kivalliq Regional Science Fair awards placement certificates up to fifth place. The First Place winner is awarded the Best in Fair Award, which may be kept at the winner's school until the next fair. The student delegation to the Canada-Wide Science Fair will be made up of the top three students (1st place, 2nd place..etc) and their names will be displayed on this trophy.

The Thomas Kudloo Memorial Qanuqtuurniq Trophy is awarded to the project that best addressed an issue of Northern relevance.. A cash prize of $100/ project participant also accompanies this trophy, which may be kept at the winner's school until the next fair.

The KSEC Tunganarniq Peer Trophy is awarded to the participant who, in the eyes of his or her peers, best exhibits spirit that is open, welcoming and inclusive. Voting for this award is done on Sunday after lunch. This trophy may be kept at the winner's school until the next fair.

2007 Kivalliq Regional Science Fair Award Winners—Rankin Inlet

KSEC Science Project Report Rubric

Project Title _____

_____

Project # _____ **Report Mark** _____**/10**

Outline and Organization (3 marks)	Does the report contain the following elements: • background • purpose, • hypothesis (if applicable) • procedure • results • conclusion • acknowledgements • bibliography	
	All elements are present and clearly developed	3
	Most Elements are present and clearly developed	2
	Some elements are present and clearly developed or most elements are present but not clearly developed	1

Presentation: (2 marks)	Is the report clearly written and free of grammar and spelling errors. Is it neatly typed?	
	Report is clearly written, neatly typed and contains few spelling and grammar errors	2
	Report is clearly written, neatly typed and contains some spelling and grammar errors	1.5
	Report is neatly typed and presented or report is clearly hand written with few errors	1
	Report is submitted but poorly presented	0.5

Communication and Accuracy (3 marks)	Does the report accurately communicate what the project is about?	
	Report is coherent and gives the reader a clear picture of what the project is about. Graphs and diagrams are clearly labeled and explained.	3
	Report is coherent and gives the reader a general idea of what the project is about. Graphs and diagrams are included or poorly presented.	2
	Report does not give the reader a clear understanding of what the project is about.	1

Logbook (2 marks)	Is there a logbook? Is it detailed and complete?	
	A logbook is present with regular dated, detailed entries for the period of time during the project's development	2
	A logbook is present with regular dated, entries for the period of time during the project's development	1
	A logbook is present with some dated, entries for the period of time during the project's development	0.5
	No logbook submitted	0

Total		**/10**

Exhibit # **Score**

KIVALLIQ REGIONAL SCIENCE FAIR

Powered by Imagination

JUDGING BOOKLET

PART A: THE DISPLAY (Max. 25 marks)

1. SKILL (Max. 10 marks)

- Is the workmanship neat and carefully done?
- Is the lettering good and spelling correct?
- Is display complete, logical and self-explanatory?
- Is the content clearly presented?

5 6 7 8 9 10
(Circle One)

2. DRAMATIC VALUE (Max. 10 marks)

- Is the display simple (not cluttered) and balanced?
- Does it capture your attention?
- Is there good use of colour and contrast?
- Do the all the elements (backboard, table and displays) work together nicely?

5 6 7 8 9 10
(Circle One)

3. BILINGUAL ELEMENTS (Max. 5 marks)

- Does the display have both Inuktitut and English?
- Are translations balanced and understandable?

0 1 2 3 4 5
(Circle One)

PART B: REPORT & LOG BOOK (Max. 10 marks)

Reports and log books will be marks one week prior to the fair.

- Does the report contain the following elements: back-ground, purpose, hypothesis (if applicable), procedure, results, conclusion, acknowledgements and bibliography?.
- Is the report clearly written (free of grammar and spelling errors); is it neatly typed?
- Does the report accurately summarize the project?
- Is there a Log Book? Is it detailed and complete?

0 1 2 3 4 5 6 7 8 9 10
(Circle One)

PART C: SCIENTIFIC THOUGHT (Max. 45 marks)

Level to be assigned by panel of teachers and KSEC, prior to judging.

EXPERIMENT	STUDY	INNOVATION	EVALUATION CRITERIA
Investigations are undertaken to test one or more hypotheses.	A collection and analysis of data showing evidence of a correlation, situation or pattern of scientific interest. Variables are identified and controlled where possible.	The development and evaluation of models or innovative devices, using techniques or approaches from the field of technology, engineering or computers.	Equipment: How sophisticated, appropriate and well constructed is the apparatus or model? Observations: How extensive is the data and number of trials? Analysis: Do the conclusions correlate well with the purpose? Discussion: Does the report include any account of experimental errors and possible applications.
Level 1 The duplication & reporting of an experiment to test a previously confirmed hypothesis.	**Level 1** A study and presentation of printed material related to the basic issue	**Level 1** The building of models or other devices that duplicate existing technology (minimal reporting).	**6 7 8 9 10 11 12 13 14 15**
Level 2 The extension of a known experiment through modification of its procedure, data gathering, analysis and application.	**Level 2** A study of material collected through compilation of or expansion of existing data and through personal observations. The study attempts to address a specific issue and includes a written report.	**Level 2** The improvement of an existing technology or the utilization of an existing technology for new applications. Some data and its evaluation are included in the report.	**16 17 18 19 20 21 22 23 24 25**
Level 3 A new approach to the design, modification or application of an existing experiment in which some of the variables are controlled. All aspects of the scientific process with data and appropriate analysis are reported.	**Level 3** A study based on new observations and research of a previously studied topic. Appropriate analysis of data and conclusions such as correlations of cause and effect are included with the report.	**Level 3** The design and construction of an innovative adaptation of an existing technology for a new application that has economic or human benefit. Data and analysis of the effectiveness of the innovation are included with the report.	**26 27 28 29 30 31 32 33 34 35**
Level 4/5 A new experimental approach to a research problem in which most of the significant variables are controlled. All aspects of the research are included in the report, together with extensive data and appropriate analysis.	**Level 4/5** A new approach to the study of a problem that correlates information from a number of sources. All significant data and variable are identified and analysed. The report also offers new insights or solutions to the problem.	**Level 4/5** The construction of a novel piece of technology or integration of several technologies to form an innovative system that has commercial or human benefit. Complete data and analysis are included with a full report.	**36 37 38 39 40 41 42 43 44 45**

PART D: THE INTERVIEW (Max. 15 marks)	
LEVEL OF UNDERSTANDING First determine the participant's level of understanding and then rate the presentation.	**PRESENTATION** Determine the level of understanding and then rate the presentation based on logic, poise, fluency, enthusiasm and confidence for that level.
WEAK Student is unsure of the material/process of project and has difficulty answering questions about the project.	**1 2 3 4 5**
GOOD Student can summarize the project adequately and can answer the majority of the questions about the project.	**6 7 8 9 10**
EXCELLENT Student explains the project very well and can answer all questions about the project clearly and logically.	**11 12 13 14 15**

PART E: NORTHERN RELAVENCY (Max. 5 marks)

- Does the topic relate to a Northern Issue?
- Is the project unique/imaginative?
- Were materials/tools used imaginatively?
- What was your overall impression?

1 2 3 4 5
(Circle One)

JUDGE'S SUMMARY

EXHIBIT NO:____ PROJECT LEVEL:____

TITLE:_____

_____

PART A DISPLAY
(Maximum 25) _____

PART B: REPORT & LOGBOOK
(Maximum 10) _____

PART C: SCIENTIFIC THOUGHT
(Maximum 45) _____

PART D: INTERVIEW
(Maximum 15) _____

PART E: NORTHERN APPLICABILITY
(Maximum 5) _____

TOTAL SCORE (A + B + C + D + E)

JUDGE'S SIGNATURE:

_____

JUDGE'S COMMENTS

_____

_____

_____

Kivalliq Regional Science Fair
Project Summary Sheet

School: _____

Student's Names: _____

_____

Digital photo of Students submitted YES NO

Project Title: _____

Project Description (State purpose and brief outline of method and results):

_____

_____

_____

_____

_____

Display Needs: (electricity, water, special tools, etc)

_____

_____

_____

_____

_____

Please email this form along with a digital photo of Project Creators to KSO (867-793-2014)

Kivalliq Science Educators' Community
Student Participant Contract for Science Fair

The **Kivalliq Science Educators' Community (KSEC)** is planning to hold the Kivalliq Regional Science Fair in _____ from _____.
The Science Fair will involve a land component and a school component.

Students' Roles and Responsibilities during the Fair
It is the responsibility of all student participants in the Kivalliq Science Fair to abide by the following guidelines:

Enroute to and During the Kivalliq Regional Fair

1. To behave at all times within the rules set out by teachers, chaperones and elders.
2. To abstain from the use or possession of drugs or alcohol during the fair.
3. To abstain from sexual involvement / dating relationships with other Kivalliq Science Fair participants and / or community members.
4. To remain in Rankin Inlet with the Science Fair at all times and to be accompanied by a chaperone or teacher.
5. To take part in all aspects of the Science Fair. To act positively with all members of the Fair and to participate to the fullest extent possible.
6. To fulfill all projects, assignments and activities within the Science Fair.
7. To attend each and every Science Fair activity unless illness occurs.
8. To be punctual for activities in the morning, after breaks and after lunch periods.
9. To attend evening activities.
10. To respect all fellow participants, teachers, chaperones and elders.

I have read the behavioural guidelines and agree to abide by them for the duration of the Kivalliq Regional Science. I also understand that failure to follow these guidelines could result in my expulsion from the Science Fair and transportation back home at my expense.

Participant's Name: _____ School: _____

Participant's Signature: _____ Date: _____

Guardian's Signature: _____ Date: _____

Canada-Wide Science Fair

The Kivalliq Region has a successful history at the Canada-Wide Science Fair. In the past 13 years Kivalliq students have collectively won 4 bronze medals, 4 special awards (Chemistry, Psychology, Food Science, and Peer Innovation) and numerous honourable mentions.

Year	Location of Canada-Wide Science Fair	Results
1995	Whitehorse, Yukon	Special Award: Chemistry
1996	North Bay, Ontario	Bronze Medal Special Award: Psychology
1997	Regina, Saskatchewan	Honourable Mention
1998	Timmons, Ontario	
1999	Edmonton, Alberta	
2000	London, Ontario	
2001	Kingston, Ontario	
2002	Saskatoon, Saskatchewan	
2003	Calgary, Alberta	Bronze Medal Honouable Mention
2004	St Johns, Newfoundland	Honourable Mention
2005	Vancouver, British Columbia	Honourable Mention
2006	Saguenay, Quebec	Bronze Medal Two Honourable Mentions
2007	Truro, Nova Scotia	Bronze Medal Special Award: Food Science Peer Innovation Award

The Kivalliq Science Educators' Community fundraises to send the Kivalliq delegation to the Canada-wide event, which occurs annually in May. The three student participants are selected from top projects in order of their placement. The Delegate is selected from the committee that hosted the Kivalliq Regional Science Fair (usually the chairperson) and the alternate delegate is usually chosen from one of the winning schools. Attending the Canada-wide event is an excellent opportunity for both students and teachers alike.

Once the delegation is selected, online registration is completed by the delegates and students (with the help of their teachers).

For more information on the Canada-Wide Science Fair check out the website of Youth Science foundation Canada:

http://www.ysf.ca/

For more information on KSEC and their programs contact:

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