

FIRESIDE ELEMENTARY

2015 SCIENCE FAIR



TUESDAY, APRIL 21, 2015

EARLY REGISTRATION 6:30 - 7:00 PM

WEDNESDAY, APRIL 22, 2015

REGISTRATION 7:30 - 8:00 AM

JUDGES' MEETING 8:00 - 8:30 AM

SCIENCE FAIR & JUDGING 8:30 - 11:30 AM

AWARDS ASSEMBLY 1:30 - 2:15 PM

PUBLIC VIEWING 6:00 - 7:00 PM

CLEAN UP 7:00 PM

FIRESIDE 2015 SCIENCE FAIR OVERVIEW

Welcome to the Fireside Science Fair where you will have fun learning about Science. The Science Fair is a great time for students to explore and discover new ideas and then share their knowledge and enthusiasm with others. Remember everyone who participates in the Science Fair is a winner! For more information and forms, this entire packet can be found on the Fireside homepage at: <http://bvsd.org/schools/fireside> under “Timely Information”. Also at this website, you can click on “Library” then “Science websites” for links to websites with additional information on Elementary School science fairs.

MATERIALS AND SAFETY

Please read the enclosed materials thoroughly as all projects will need to follow the attached Boulder Valley School District rules and safety guidelines. Remember *no liquid or organisms* are allowed at the Science Fair. Pictures of projects with these are acceptable.

PROJECT APPLICATION FORMS

Please complete the attached Project Application Form and return it to the office by *Friday, March 13th*. The Science Fair Committee will review your project to be sure it meets all of the applicable school and district guidelines. If concerns with your project are noticed, you will be notified in a timely manner to alter or choose another project.

REGISTRATION & SCIENCE FAIR DAY

The Science Fair will be held on *Wednesday, April 22nd* in the Fireside Gymnasium.

AGAIN THIS YEAR, registration will be offered at two separate times:

- *Tuesday, April 21 from 6:30-7:00 p.m.* – If you have your project completed, why not beat the rush and register & set up your project the night before?
- *Wednesday, April 22 from 7:30 – 8:00 a.m.* – If you need every last minute to prepare, you can still register and set up your project the morning of the Science Fair.

There will also be a viewing time in the evening on Wednesday, April 22 from 6:00 - 7:00 p.m. so your family, friends, and community can see all the projects. You can take your Science Fair project home after that.

TYPES OF PROJECTS

Non-Competitive Project: (All Grades) Projects can be done individually or with a partner. The project can either be a model/demonstration or an experiment. Students may do these projects with minimal assistance from parents or the students and parents can participate equally in the process and development of the display. Judges will informally review these projects and everyone who enters a project will receive participation ribbons and certificates.

Competitive Student Project: (3rd - 5th Grades) Projects can be done individually or with a partner. The project should contain an investigation that follows the Scientific Method. This is a student-led project with minimal parental involvement and should meet all of the school and BVSD requirements included in this packet. These projects will be judged and the outstanding projects will be recognized with special awards. All projects will receive participation ribbons and certificates.

PROJECT IDEAS

For project ideas, you can reference the attached “Science Fair Projects Ideas” List. You can also try these web sites for ideas and tips on creating a science fair project:

<http://school.discoveryeducation.com/sciencefaircentral>

<http://ipl.org/div/projectguide>

<http://sciencebuddies.org>

<http://science-ideas.com>

<http://www.carolina.com> (for science supplies)

These web sites are provided for your information and do not constitute an endorsement or recommendation. As always, adults should determine appropriateness before using with children.

DISPLAY REMINDER

For safety reasons, remember that no liquid or organisms of any kind, ***including water and plants,*** may be displayed at the Science Fair. Liquids and plants may be used in experiments but they may not be brought to school the day of the fair. We recommend that you take pictures of your experiments and include these on your display instead of having the actual liquid or organism at the Science Fair. See the attached BVSD Safety Display Guidelines for a detailed list of what is not allowed.

SCIENCE FAIR BOARD

All Science Fair projects must be presented on a Science Fair Project Board. These can be found at local arts and crafts stores, such as Michaels and Hobby Lobby.

Project Display Examples:



VOLUNTEERS

Volunteers are needed to help with judging projects, supplying food for the judges, registration and set-up and clean-up. We need judges for both the competitive and non-competitive division and a scientific background is not needed to judge a non-competitive project. If you or someone you know can help, please complete the attached Science Fair Volunteer Form and return it to the front office.

QUESTIONS

If you have questions you may contact Janine Fitzgerald, the Talented and Gifted Educational Advisor, @ 720-561-7918 or janine.fitzgerald@bvsd.org, or the Science Fair committee (Andrea Simons @ andrea-simons@hotmail.com, Teresa Buch @ teresa@buch.us, Kate Lemere @ katelemere@comcast.net, or Nicole Düster @ nlduster@yahoo.com).

SCIENCE FAIR PROJECT APPLICATION

DUE FRIDAY, MARCH 13, 2015

(Please Return to Front Office)

STUDENT NAME(S) _____

GRADE(S) _____ TEACHER(S) _____

PHONE NUMBER(S) _____

EMAIL ADDRESS(S) _____

PARENTS: Please sign to indicate that you have read the entire Fireside Science Fair Packet including the BVSD Safety Display Guidelines, and that you will help your child follow the guidelines and oversee the safety of their project.

Parent Signature _____

STUDENT(S): Please indicate your project category and give a detailed description of the project you plan to do.

___ Non-Competitive (All Grades) – Experiment, Model, Survey or Demonstration

___ Competitive Student (Grades 3-5) - Investigation that follows the Scientific Method

PROJECT DESCRIPTION: (use back if necessary)

- Statement of Problem/Hypothesis -

- Proposed Procedure -

Any special display requirements (such as electrical outlet)? _____

_____ This project is approved by the Science Fair Committee.

SCIENCE FAIR VOLUNTEER

(Please Return to Front Office)

If you are able to volunteer to help with the Science Fair, please complete the information below so we know what you can help us with this year. And THANK YOU!

NAME: _____ CHILD'S NAME:

PHONE NUMBER(S): _____

EMAIL ADDRESS: _____

_____ **SET-UP** (Tuesday, April 21, 2:30 pm)

_____ **EARLY REGISTRATION** (Tuesday, April 21, 6:20 - 7:00 pm)

_____ **FOOD FOR JUDGES** (Drop off Tuesday, April 21, 6:30 - 7:00 pm
or Wednesday, April 22, 7:30 - 7:45 am)

_____ **REGISTRATION** (Wednesday, April 22, 7:20 – 8:00 am)

_____ **JUDGE** (Wednesday, April 22, 8:00 – 11:30 am) *

- Do you have a scientific background? Yes _____ No _____
- Do you have a preference for which projects to judge?
Competitive _____ Non-competitive _____ Put me where you need me most _____
- If you have a child at Fireside, what grade(s) are they in?

_____ **CLEAN-UP** (Wednesday, April 22, 7:00 PM)

* Please note, a background in science is not required to judge a non-competitive project and **all judges will be instructed on how to evaluate the projects.**

TYPES OF SCIENCE FAIR PROJECTS*

1. **INVESTIGATION:** Observe plants, animals, or people and report what you observe. You want to find out how your subjects behave or how they react to something you do to them. This type of project should follow the scientific method. There are 3 types of investigations you can perform:

- **Comparative Surveys:** These surveys are sometimes called natural experiments. Identify two or more groups or classes of subjects that are generally alike but which may show a difference in one or more important factors. Express the difference as a hypothesis.
EXAMPLES: "Boys' hearts beat faster than girls' hearts do." or "Kids have a better memory than adults."
- **Simple Experiment:** In this experiment your purpose is to answer a simple question.
EXAMPLES: "Which metals conduct heat?" or "Which rocks are harder?"
- **Controlled Experiment:** This kind of experiment involves more complex investigations.
EXAMPLE: You might have a group of plants as an experimental subject and another group of the same type of plants as a control group. The independent variable in this experiment is the amount of chemical fertilizer added to the experimental plant group. The dependent variable is the difference observed in the growth of the plants.

2. **MODEL OR COLLECTION:** Construct a model, or exhibit a collection. The purpose is to provide an answer to a question or hypothesis you are presenting. You must be able to explain your model or collection.

EXAMPLES: Create a model of a solar home or display your collection of crystals/ rocks and explain the differences.

3. **BEHAVIORAL AND SOCIAL SCIENCE:** These projects usually involve surveys and/or human observation. When conducting a survey the following guidelines must be followed:

- All survey questions must have prior approval of the school science fair committee and must be administered by the student.
- All survey questions must be approved prior to administering them to students.
- Students must notify interviewees of the purpose for the study.
- Students must conduct the surveys.
- There can be no deceptive use of the results.
- Prior permission must be obtained from parents to survey minors.
- Failure to meet these criteria will be grounds for exclusion from the school science fair.

EXAMPLE: "Do students prefer vanilla or chocolate ice cream?"

4. **DEMONSTRATION OF A SCIENTIFIC PRINCIPLE:** Find a scientific rule or law that is interesting to you.

EXAMPLES: Demonstrate how a volcano erupts or how to turn salt water into fresh water or how the planets move around the sun.

** Note: A NON-COMPETITIVE project may perform any of the above project types, however a COMPETITIVE project must perform an Investigation per #1 above.*

WAYS TO FIND A SCIENCE FAIR PROJECT IDEA



1. Look at lists of **science categories** and pick one that you are interested in, and then narrow that down to a project. (Example, say you pick psychology, then narrow it to the differences between boys and girls, then to a topic like "Do boys remember boy-type pictures (footballs) better than girl-type pictures (flowers)?" (Two pages of categories are included on the attached "Science Fair Project Ideas" list.)
2. Use **your experiences**. Remember a time you noticed something and thought, "I wonder how that works?" or "I wonder what would happen if..." then turn that into a project. Check the science section of the school **library**. Browse and look at book titles, then look inside the ones that look interesting to you. Also thumb through encyclopedias and magazines. Good magazines for ideas are: National Geographic, Discover, Omni, Popular Science, Popular Mechanics, Mother Earth News, High Technology, Prevention, and Garbage. Perhaps go to the downtown Library.
3. Think about **current events**. Look at the newspaper. People are hungry in Africa because of droughts - a project on growing plants without much rain, which types grow OK with little water? Or the ozone hole over Antarctica - how can we reduce ozone? -a project on non-aerosol ways to spray things. Or oil spills - how can we clean them up? -a project on how to clean oil out of water.
4. Watch **commercials** on TV. Test their claims. Does that anti-perspirant really stop wetness better than other ones? What are the real differences between Barbie and imitation Barbie dolls? Can kids tell the difference between cola drinks if they don't know which they are drinking?

THE SCIENTIFIC METHOD

Here is an overview of the scientific method that you will need to understand in order to complete your science fair project.

1. **Stating the Question (Purpose):** What is it that you are trying to find out from your experiment? What is it that you are trying to achieve?
2. **Research Your Topic:** Investigate what others have already learned about your question. Gather information that will help you perform your experiment.
3. **State Your Hypothesis:** After having thoroughly researched a topic, you should have some prediction about what you think will happen in your experiment. This educated guess concerning the outcome is called your hypothesis. You must state your hypothesis in a way that you can readily measure.
4. **Create List of Materials:** State what you will need to use to perform the experiment.
5. **Test Your Hypothesis by Doing an Experiment (Procedure):** Now that you have come up with a hypothesis, you need to develop a procedure for testing whether it is true or false. This involves changing one variable and measuring the impact that this change has on other variables. When you are conducting your experiment, you need to make sure that you are only measuring the impact of a single change. You should also determine how you plan to measure the results.

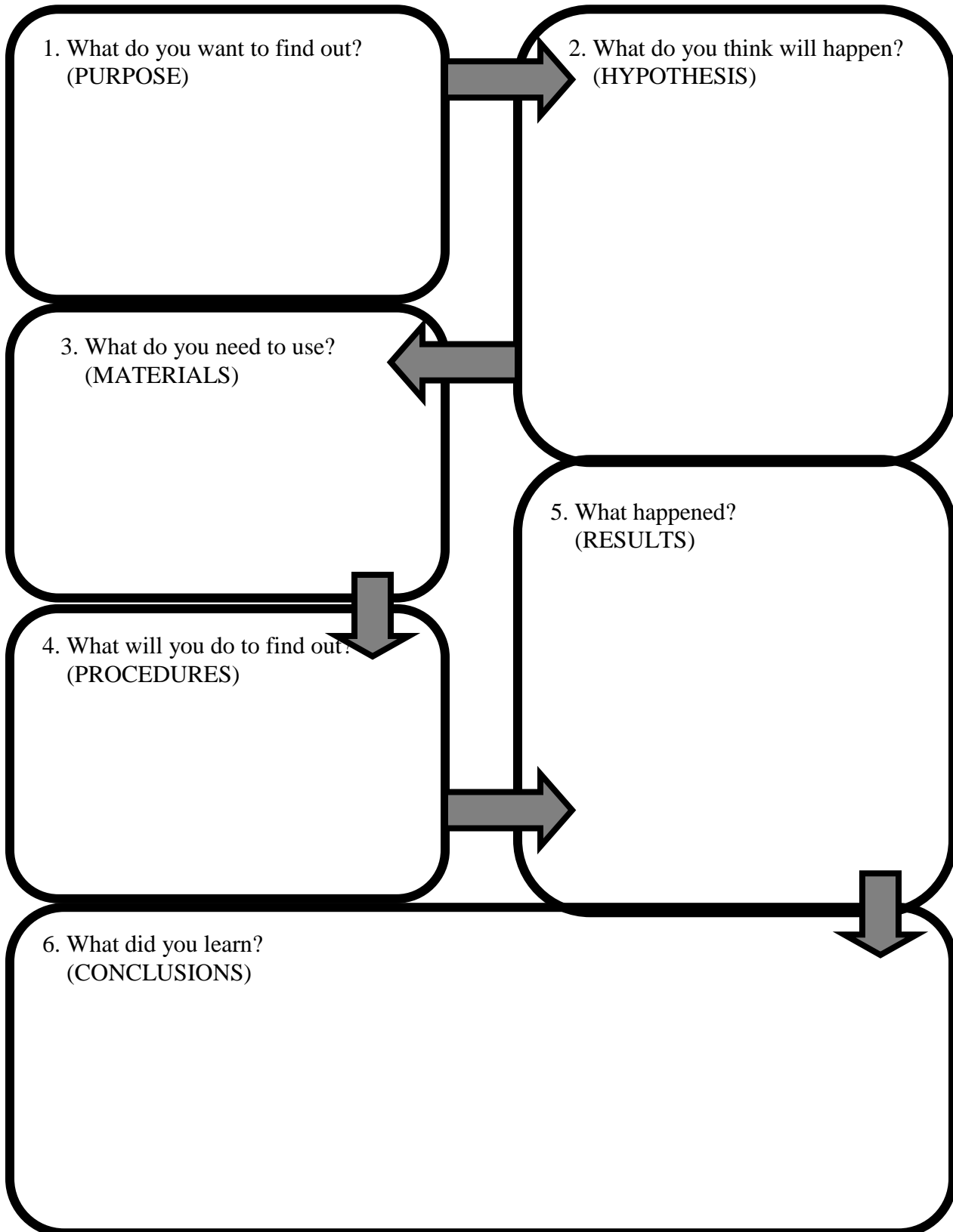
Scientists run experiments more than once to verify that results are consistent. Each time you perform your experiment, it is called a **run** or a **trial**.

6. **Analyze Your Results:** At this stage, you want to be organizing and analyzing the data that you have collected during the course of your experiment in order to summarize what your experiment has shown you. Try to use charts, graphs or tables to help understand the results and present them clearly.
7. **Draw Your Conclusion:** This is your opportunity to explain the meaning of your results. Did your experiment support your hypothesis? Does additional research need to be conducted? How did your experiment address your initial question and purpose? Even if your hypothesis was incorrect, the experiment is still an important learning opportunity and is considered a valid project for display.

Throughout the process of doing your project, you may want to keep a journal containing all of your important ideas and information. This journal is called a laboratory notebook and should be brought with you to the Science Fair.

THE SCIENTIFIC METHOD

A student record sheet for an experiment or science project



7 STEPS TO PREPARE A NON-COMPETITIVE SCIENCE FAIR PROJECT (All Grades):

1. Select a Topic -

Take a look at the attached “Ways to Find a Science Fair Project Idea” and the “Science Fair Project Ideas” list, or go to any of the Internet web sites listed on the 3rd page to help select a topic. Review the attached “Types of Science Fair Projects” handout to determine what type of project to perform on that topic— any of them are suitable for a non-competitive project. i.e. Either performing an experiment/survey or creating a model/giving a demonstration of how something works.

2. Gather Background Information & Submit Project Application –

Gather information about your topic from books, magazines, the Internet, people and companies. Then complete a Science Fair Project Application Form and return it to the front office.

3. If Performing an Experiment –

Try to follow the Scientific Method and items #3 through #6 on the “8 Steps to Prepare a Competitive Science Fair Project” sheet. Following all the steps and the Scientific Method is not required for non-competitive projects. However, it is a good outline to try and follow and will help prepare younger students who want to practice for the competitive level in future years.

4. If Creating a Model or Preparing a Demonstration -

Find a subject in nature/science that is interesting to you and create a model of it. Or, find a scientific rule or law and demonstrate how it works.

5. Construct an Exhibit or Display -

Create a display on a Science Fair Project Board that is available at local arts and crafts stores, such as Hobby Lobby and Michaels. Make sure to write your name(s) on the board. It has to be neat, but it does not have to be typed. You may bring any items you used in your model/demonstration or experiment to help show what you did except liquids (including water) and any organisms (plants or animals). Make it fun, but be sure people can understand what you did.

6. Practice Presentation to Judges -

Practice explaining your project to someone (parent, friend, grandparent, etc.). Even though this is non-competitive, you will still be speaking with judges. They will just be asking you a few questions about your project. Please try to answer the questions on your own and only have your parent help if you get “stuck”. The judges are very nice and will be interested in what you did and what you learned.

7. Come to the Fair and Have Fun! -

Bring your project and display board to school either the night before or early on the day of the Fair. Remember, no liquids may be displayed at the Science Fair.

8 STEPS TO PREPARE A COMPETITIVE SCIENCE FAIR PROJECT (3rd-5th Grade only):

8. Select a Topic -

Take a look at the attached “Ways to Find a Science Fair Project Idea” and the “Science Fair Project Ideas” list, or go to any of the Internet web sites listed on the 3rd page to help select a topic. Then review the “Types of Science Fair Projects” and select one of the options under #1 – INVESTIGATION. These allow you to use the Scientific Method by either performing an experiment or conducting a comparative survey.

9. Gather Background Information & Submit Project Application –

Gather information about your topic from books, magazines, the Internet, people and companies. Then complete a Science Fair Project Application Form and return it to the front office.

3. Follow the Scientific Method – See the two attached information sheets on the Scientific Method.

4. Run Controlled Experiment and Record Data -

Perform the experiment as described above. Keep notes in one place. Write down everything you can think of, you might need it later.

5. Create Graphs, Charts and/or Tables -

What happened? Answer that question and put the results in graphs, charts and/or tables if possible.

6. Construct an Exhibit or Display -

Create a display on a Science Fair Project Board that is available at local arts and crafts stores, such as Hobby Lobby and Michaels. Make sure to write your name(s) on the board. Your display should include the title, hypothesis, list of materials, procedure, results and conclusion. It has to be neat, but it does not have to be typed. Charts, graphs, tables or photographs make your display more appealing. You may bring any items you used in your investigation to help show what you did except liquids (including water) and any organisms (plants or animals).

7. Prepare for Presentation to Judges -

Practice explaining your project to someone (parent, friend, grandparent, etc.). Make sure you understand everything you did and why. Explain why your project matters and how you will use it in everyday life (if possible). You may want to rehearse a presentation at home, *however parental involvement during the presentation at the Science Fair is discouraged*. Here are some tips for what the Judges are looking for:

- Following the Scientific Method.
- Enthusiasm for the work performed.
- Having a neat, organized project board.
- Giving a good oral presentation.
- Having minimal parental involvement.
- Having a thorough understanding of the project, especially the results.

8. Come to the Fair and Have Fun! -

Bring your project and display board to school either the night before or early on the day of the Fair. Remember, no liquids may be displayed at the Science Fair.

BVSD SAFETY DISPLAY GUIDELINES

Anything which could be hazardous to the public, the exhibitor or other exhibitors is PROHIBITED.

Organisms: No organisms may be displayed. For example:

Vertebrates-	No owl pellets No mice, live or dead No skeletons No fish, live or dead
Microbial cultures-	No fungi, live or dead No bread molds, bacteria, viruses, viroids, prions, rickettsia, live or dead No parasites, human or other, live or dead
Invertebrates-	No worms, live or dead No insects, live or dead
Plants-	No plants in soil

Chemicals: No chemicals may be displayed. For example:

No acids, dilute or strong
No bases, dilute or strong
No salt solutions
No insecticides
No repellents
No mercury

Flammable substances: No flammable substances may be displayed. For example:

No gases
No solid rocket fuel
No flammable liquids
No fumes

An alternative solution to displaying the above items:

Take photographs of the substances that were used or use a digital camera and create large pictures with a computer printer for display on your board.

Electricity:

- **Projects in the electricity category require the following:** Electrical connections using voltage over 12 volts must be soldered or fixed with approved connectors and all connecting wires must be properly insulated. Nails, tacks or un-insulated staples must not be used to fasten wire. All switches and metal parts must be located out of reach of observers and be designed with adequate overload protection. Bare wiring and exposed knife switches may be used on circuits of 12 volts or less only.
- **If the project requires an electrical outlet:** Only one 110 volt, 60 cycle, single phase AC connection will be provided for exhibits (if requested in advance).

THE SCIENCE FAIR COMMITTEE WILL INSPECT ALL PROJECTS FOR ADHERENCE TO SCIENCE FAIR SAFETY GUIDELINES.

BVSD SCIENCE FAIR OPERATING PRINCIPLES

Objectives

The goal of the Science Fair is to encourage interest in science, to feel accomplishment and pride in completing research projects, and most importantly to instill a genuine love of science and learning.

Science Fair objectives:

- Provide students with exciting opportunities to work on a science topic of their own choosing (which need not necessarily relate directly to the curriculum at a particular grade level)
- Stimulate interest in science, math, and engineering
- Develop inquiry and investigation skills
- Increase knowledge and skills
- To exhibit projects and share ideas with other students and community members
- Provide opportunities for students to receive feedback from professional scientists and community members
- Be a fun event where ALL students are given public recognition for their hard work and effort

Roles and Responsibilities

The goal of the Science Fair is not “winning”. In order to maximize your student’s experience, please follow these guidelines and responsibilities. The Science Fair should be a fun project that turns students on to science. Learn together, explore together and then let the child express the topic in his or her best way!

Student’s Role is to:

- Select a topic for the project and gain approval for the project
- Complete an investigation, model, collection or demonstration of a scientific principle
- Construct an exhibit
- Use scientific terms in the display and explanation of the project to other students and community members
- Follow BVSD Science Fair Safety Guidelines

Parent’s Role is to:

- Be a good listener
- Provide information on the topic as a resource person
- Motivate the young scientist to do their best work
- Furnish supplies and help locate needed equipment
- Transport students to library or resource people
- Provide space such as in the home for student to work on the project
- Encourage the student who is the primary scientist completing the project
- Ensure student safety and follow BVSD Safety Guidelines.