STAY ORGANIZED WITH A SCHEDULE

This may be the first time you have attempted a long range project, so it is very important to make a schedule and stay organized. Science Fair projects often require several weeks for completion. Don't let a due date that is many weeks away throw your planning off; there are many things to do. Here is an example of a project plan for starting eight weeks before the Science Fair.

Check Off

( ) **Week 1** Turn in the registration form. Think about your project. Talk to people, read, and collect ideas. Decide on the purpose of your project. Write an objective title. State a hypothesis. Describe what you will do. Do you need to check with an adult? **Submit forms and receive approval before beginning project if your project includes human subjects or vertebrae animals.**

( ) **Week 2** Change title or idea if necessary. Collect information. Conduct experiments. Collect data.

( ) **Week 3** Continue experiments. Make appointments with resource people who may help you with your idea.

( ) **Week 4 & 5** Continue experiments. Collect and check your data (answers) to see that your experiments are working. Write a rough draft of what you have done. Get opinions from a parent or other adult on what you have done.

( ) **Week 6** Chart your results. Graph your data. Look for patterns in your answers.

( ) **Week 7** Write a summary of your experiments and conclusion about your results. Begin drawings and posters. Get all materials for your display.

( ) **Week 8** Finish your reports. Put together your exhibit. Show it to classmates, friends and family. Ask for ways to improve your exhibit. Make sure the topic and your results are easy to understand. Practice, practice, and practice presenting your project.

THERE IS NO SUBSTITUTE FOR GOOD PLANNING!

Scientific *Process*

Following is an example of the scientific process that we suggest you use.

1. TOPIC
2. PURPOSE
3. HYPOTHESIS
4. PROCEDURE (Experiment)
5. RESULTS (Data)
6. CONCLUSIONS
7. DISPLAY

KEEP A JOURNAL

TOPIC - Select a topic that can be answered only by experimenting.

1. Write your topic as a *question* to be investigated.

SELECTING A TOPIC

1. *HELP* in finding a topic. *READ* science books, magazines, and newspapers. *TALK* to your teacher, family, and friends. *VISIT* professional people, museums, and zoos.
2. Select a topic you know nothing about. Something new may arouse your curiosity.
3. Select a topic that you know something about, but you want to investigate further.
4. Select a topic that genuinely interests you.

Kindergarten - Grade 2 Ideas

In grades K-2, student projects should illustrate, report, or model a science concept or subject area. At this level, students can choose from four categories.

Pick a category first:

- Model
- Collection
- Demonstration - explains how something works, or why something happens the way it does.
- Experiment - answers a question or solves a problem. If you choose an experiment be sure to follow the scientific method.

Examples of ***models*** are:

ant farm | human eye | human brain | rockets
parts of a plant | solar system | bird beaks and their functions
types of human joints | parts of an airplane

Examples of ***collections*** are:

Seeds | shells | rocks | minerals | fossils | insects
Animal tracks | soils | leaves | bugs | sand | fish

Examples of ***demonstrations*** are:

How a bicycle works | how we get drinking water | the rock cycle
How simple machines work | how bread rises | life cycle of a butterfly

Examples of an ***experiment*** are: (phrase title in the form of a question)

How does light affect bean growth? | Which color fades the fastest?
Does color affect taste? | Which gum blows the biggest bubble?
Does a more expensive battery last longer? | Which bread molds faster?

All students should be able to explain their projects orally. Remember, you'll have a display to show any helpful information.

Grades 3-5 Project Ideas

In grades 3, 4, and 5, students will choose from one of two areas for their projects.

Pick a project type first:

- Demonstration of a scientific principle - explains how something works, or why something happens the way it does (Some examples of scientific principles would include, gravity, inertia, force, power and energy.)
- Experiment - answers a question or solves a problem. If you choose an experiment, be sure to follow the scientific method.

Example of a ***demonstration of a scientific principle***:
Gravity in relationship to an objects mass (dropping different objects from the same height and measuring the rate at which they fall).

Examples of an ***experiment*** are (phrase title in the form of a question)
How does light affect bean growth? Which color fades the fastest?
Does color affect taste? Which gum blows the biggest bubbles?
Does music affect heart rate? Which bread molds faster?

PLEASE REFER TO PAGES 9 AND 10. ALL OF THE DIFFERENT SCIENCE FAIR PROJECT CATEGORIES ARE LISTED AS WELL AS MORE EXAMPLES OF PROJECT TITLES.

ADDITIONAL INFORMATION ON THE SCIENTIFIC METHOD CAN BE FOUND ON PAGE 6. THE STEPS IN FOLLOWING THE SCIENTIFIC METHOD ARE FOUND ON PAGES 6 THROUGH 17.

Purpose

One to three sentences that explain why you are doing this investigation.

"The purpose of this project is....."

If your purpose is well worded, you will have little difficulty writing a title for your project.

Hypothesis

A hypothesis states what you think is going to happen when you investigate a question.

Examples:

Question: *Does light affect the way plants grow?*

Hypothesis: Plants will grow toward the light.
Hypothesis: Plants will grow away from the light.
Hypothesis: Light will make no difference in the way plants grow.

Question: *What materials will a TV remote penetrate?*

Hypothesis: Solids, such as wood, cardboard or metals will not allow penetration of a TV remote.
Hypothesis: Flexible solids, such as plastic bags or fabric, will allow penetration.

Question: *Which glue is the strongest?*

Hypothesis: Sugar glue is stronger than all the others.
Hypothesis: Elmer's glue is stronger than Super glue.
Hypothesis: There is no difference between colored glue strength and white glue strength.

VARIABLES

There are three types of variables:

1. **Manipulated Variable** – What you change on purpose in an investigation.

2. **Responding Variable** – The responding variable is what changes by itself because you manipulated (changed) something in your investigation.

3. **Variable Held Constant** – Everything else in your investigation must be held constant (kept the same). This is often called *control.*

EXAMPLES:

Question.....*What materials will a TV remote penetrate?*

Manipulated
Variable.....Objects placed between the remote and the television

Responding
Variable.....Activation of the television (does it turn on with the remote)

Variables held
Constant.....Location of remote
Distance between remote and TV
Location of TV
Method of using remote

Question.....*Do all brands of paper towels absorb the same amount of water?*

Manipulated
Variable.....Brands of paper towels

Responding
Variable.....Amount of water that is absorbed by each towel.

Variables held
Constant.....Size of paper towel
Amount of water poured on each towel
Temperature of the water used
Container Towels are placed in
Method of pouring

Journal

A journal is like a diary of your scientific investigation. It will serve to help you document observations, problems and progress of your investigation.

** The judges at the Science Fair may wish to look through it.

Your journal should include:

1. Detailed day-by-day notes on the progress of your project.
    a. What you are actually doing each day (observations, progress).
    b. Problems you have with your investigation.
    c. Things you would change if you were doing this investigation again.
2. Any drawings/photos that you aren't using on the display that might help explain your work.

These are your rough notes, not to be redone.

Bibliography

List alphabetically all books, articles, people, or other sources used for researching.

AUTHORS

Last name, First name, Title of Book, City, Publisher, Date Published

Last name, First name, "Article," Magazine, Pages, Date Issued

Results – Data

1. Graphs
2. Charts
3. Illustrations
4. Photos

GRAPHS - MAKING A GRAPH

TITLE

RESPONDING VARIABLE
(Vertical Axis)

MANIPULATED VARIABLE
(Horizontal Axis)

Title: The title is a short description of the data being displayed.

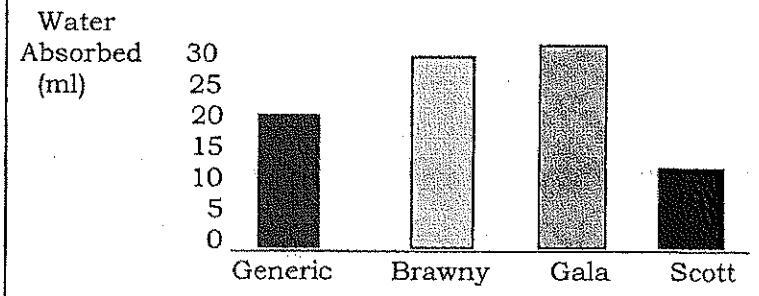
Horizontal Axis: The manipulated variable (what you changed on purpose) is displayed on the horizontal axis.

Vertical Axis: The responding variable (what happened as a result of what you changed) is displayed on the vertical axis.

There are two main types of graphs.

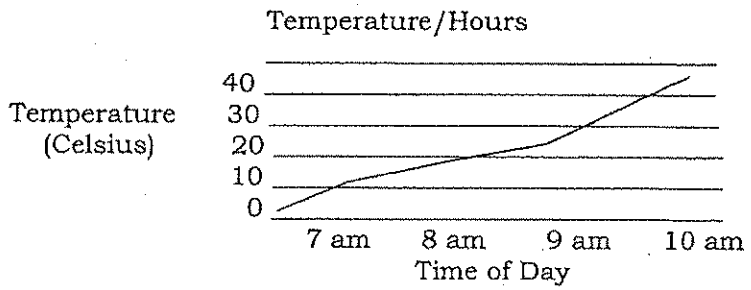
BAR GRAPH

A Bar Graph is used to display data that does not occur in a continuous manner.



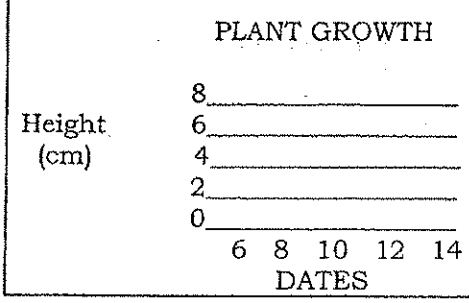
LINE GRAPH

A Line Graph is used to display data that occurs in a continuous manner.

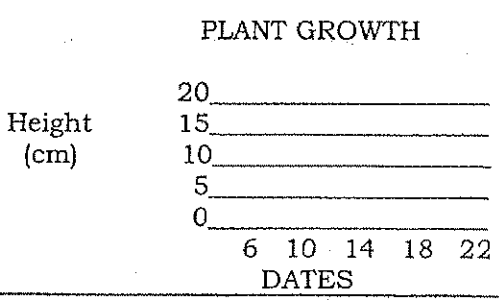


Graph Spacing - Plan your graph so that your data will be evenly distributed across the horizontal and vertical axes.

Correct Spacing



Incorrect Spacing



YOUR SCIENCE DISPLAY should include the following:

- Title
- Your name
- Summary of information
- Explanation of your experiment, model or collection
- Display items (set up)
- Charts, diagrams, graphs or pictures
- Conclusion
- Written report

SAFETY RULES & REGULATIONS

1. Dangerous chemicals, open flames and explosives will not be permitted.
2. Poisonous or dangerous plants will not be permitted.
3. Ordinary doorbell push buttons will not be allowed to control electric current of 110 volt or higher. Electronic equipment must be properly insulated. This rule is essential to prevent serious electric shock.
4. If batteries are used, they must be sufficient to maintain operation throughout the time of the fair. Storage batteries shall be protected so that they will not cause damage.
5. The Science Fair Committee reserves the right to refuse any exhibit, which is unsafe or inappropriate.
6. Humane treatment of living animals, especially vertebrates, must be a guideline. The following are prohibited: >exposing animals to shock, chemicals or stress of any kind, >no live animals may be displayed at the fair, >no actual parts of vertebrate animals will be displayed, >no bacteria of fungus can be displayed at the fair. (Simple behavior studies such as a maze are acceptable.

NOTE: You can use pictures, drawings, or models as a substitute for the animals or bacteria listed above.

USE OF ANIMAL/HUMANS

If your project involves using live animals or human subjects, you MUST meet with the science fair coordinator before beginning your project. Special forms need to be completed and approved by either a veterinarian or physician. Humane treatment of living animals, especially vertebrates, must be a key guideline. You are prohibited from exposing animals to shock, chemicals or stress of any kind.

PROJECT LIMITATIONS AND REQUIREMENTS

- No living organisms will be exhibited at the fair.
- The exhibition of human and animal parts is prohibited except: teeth, nails, animal bones, histological sections and liquid tissue slides properly acquired. Sealed insect collections will be permitted.
- Exhibit spoiled foods; molds, bacteria, microorganisms or any other type of cultured growth is not permitted, unless they are in a sealed plastic container.
- Plants may be exhibited.
- Liquids may be exhibited as long as they are in sealed plastic containers. This liquid may not be harmful in any way, should it accidentally be opened.

Your Exhibit *The purpose of your exhibit is to show the results of your experimentation clearly and attractively. Your display must always be strong enough to stand by itself and sturdy enough to withstand viewing by many people.*

Please consider these suggestions.....

1. This is your exhibit; you should do most of the work by yourself.

2. Make the title LARGE, clear and neat.

3. Labeling should be neat and informative.

4. Make large and clear explanations.

5. Remember, make your project tell the story of your experimentation. Include: purpose, hypothesis, procedure, results and conclusion.

6. Make your exhibit so that it will fit on a 'card' table. Projects should not exceed 60 inches above table and a freestanding floor project should not exceed 6 feet in height.

7. Make your exhibit durable. Use heavy cardboard, pegboard, tag board or any sturdy material for support. Assemble the three sections of the backboard with hinges or strong, wide tape. Or, for a small cost, display boards can be purchased from a teacher's store, craft store or business supply store. Keep the cost of your exhibit under control. A simple project that is well displayed and explained is the best.

8. Print your name, grade level and teacher's name on a 3 x 5 index card. Attach the card to the front of your project on the top left hand side.

9. Be certain that you are able to explain your exhibit to others. During the Science Fair, be prepared to answer judges' questions regarding your project.

10. Normal wear and tear on exhibits is to be expected during the time the fair is open to the public. For this reason, each participant is advised to protect his or her exhibit as carefully as possible. Valuable objects should be securely fastened or covered.

Science Fair Project Judging Criteria

⇒ Scientific Thought

Does the project follow the scientific method? (hypothesis, method, data, conclusion).
Is the problem clearly and concisely stated?
Are the procedures appropriate, organized and thorough?
Is the information collected accurate and complete?
Does the study illustrate a controlled experiment that makes appropriate comparisons?
Are the variables clearly defined?
Are the conclusions accurate and based upon the results?
Does the project show the child is familiar with the topic?
Does the project represent real study and effort?

⇒ Creative Ability

How unique is the project?
Does the exhibit show original thinking or a unique method or approach?
Is it significant and unusual for the age of the student?
Does the project demonstrate ideas arrived by the child?

⇒ Understanding

Does it explain what the student learned about the topic?
Did the student use appropriate literature for research?
Is a list of references or bibliography available?
In the exhibit, did the student tell a complete and concise story and answer some questions about the topic?

⇒ Clarity

Did the student clearly communicate the nature of the problem, how the problem was solved, and the conclusions?
Are the problems, procedures, data, and conclusions presented clearly and in a logical order?
Did the student clearly and accurately articulate in writing what was accomplished?
Is the objective of the project likely to be understood by one not trained in the subject area?

⇒ Dramatic Value

How well did the student design and construct the exhibit?
Are all of the components of the project done well? (exhibit, paper, abstract, log of work)
Is the proper emphasis given to important ideas?
Is the display visually appealing?
Is attention sustained by the project and focused on the objective?

⇒ Technical Skill

Was the majority of the work done by the student, and was it done at home or in school?
Does the project show effort and good craftsmanship by the student?
Has the student acknowledged help received from others?
Does the written material show attention to grammar and to spelling?
Is the project physically sound and durably constructed? Will it stand normal wear & tear?
Does the project stand by itself?

Your Presentation to the Judges

When you decide to be in a Science Fair, you must consider your presentation as important as any other part of your project. Practice will make the difference in how well you present your self to the judges.

Here is a step-by-step approach to constructing your presentation.

1. Introduce yourself, *"Hello, my name is _____."*

2. Give the title of your project *"The title of my project is _____."*

3. Explain the purpose of your project. *He purpose of my project is _____."*

4. Tell the judges how you got interested in this topic.

5. Explain your procedure. *"The procedure that I followed was _____."*

6. Show your results. If you have charts, graphs, or a notebook, show them to the judges and explain them. If results are shown on your blackboard, point them out.

7. List your conclusions. Explain what you have proven. If you think that you had some problems or error in your experiments, don't be afraid to admit these.

8. Tell the judges what you might do in the future to continue your experimentation. What would you have done differently if you were to do the project again?

9. Of what importance is your project to the world? Explain any application of your study.

10. *"Do you have any question?"* If you do not know the answer to a judge's question, then say *I'm sorry, but I don't know the answer, but I think it is _____."*

11. THANK THE JUDGE!

Akin Road Elementary Science Fair Judging Form GRADES 3-5

(Adopted from the SC/SW Minnesota Regional Science and Engineering Fair Judging Form)

Student's Name_____Grade_____ Project #_____ Judge:

Project Title_____

Students are judged on the following criteria : Creative Ability, Scientific thought, thoroughness, skill, and clarity as reflected in the questions below.

1=unsatisfactory 2=needs improvement 3=satisfactory 4=very good 5=excellent
Judges, please circle the point value for each question, Initial at the top, and leave comments on the back if you desire. You may total your amounts ONLY if there is time.

1. Does the project show creative ability and originality? 1 2 3 4 5 _____

2. Does the project demonstrate ideas developed by the student? 1 2 3 4 5 _____

3. Is the project unique? 1 2 3 4 5 _____

4. Was the experiment limited to allow for an appropriate approach? 2 3 4 5 _____

5. Are the methods used for the experiment appropriate? 1 2 3 4 5 _____

6. Are the **variables** clearly recognized and defined? 1 2 3 4 5 _____

7. Are the controls correctly used? 1 2 3 4 5 _____

8. Is there data to support the conclusion of the experiment? 1 2 3 4 5 _____

9. Did the student do the majority of the work? 1 2 3 4 5 _____

10. Did the student research the topic using at least 2 resources? 1 2 3 4 5 _____

11. Is a reference list or bibliography of research provided? 1 2 3 4 5 _____

12. Does the student completely describe the project? 1 2 3 4 5 _____

13. Does the student show interest and enthusiasm? 1 2 3 4 5 _____

14. Is the project visually appealing and well-organized? 1 2 3 4 5 _____

15. Does the student use correct grammar/spelling? 1 2 3 4 5 _____

16. Does the student have a completed notebook or journal? 1 2 3 4 5 _____

17. Is there thorough research shown? 1 2 3 4 5 _____

18. Does the student have ideas for improving the project? 1 2 3 4 5 _____

19. Does the student answer questions about the project clearly? 1 2 3 4 5 _____

20. Did the student allow adequate time to complete it with care? 1 2 3 4 5 _____ Total: /100

Akin Road Elementary Science Fair Judging Form GRADES 1-2

(Adopted from the SC/SW Minnesota Regional Science and Engineering Fair Judging Form)

Student's Name_____ Grade_____ Project #_____ Judge:
Project Title:_____

Students are judged on the following criteria: Creative Ability, Scientific thought, thoroughness, skill, and clarity as reflected in the questions below.

1=unsatisfactory 2=needs improvement 3=satisfactory 4=very good 5=excellent
Judges, please circle the point value for each question, initial the top, and leave comments at the bottom if you would like to. You may total amounts only if there it time.

1. Does the project show creative ability and originality? 1 2 3 4 5 _____
2. Does the project demonstrate work developed by the student? 1 2 3 4 5 _____
3. Are the methods of completion appropriate and thorough? 1 2 3 4 5 _____
4. Did the student research the topic using several sources? 1 2 3 4 5 _____
5. Does the student appear to understand the subject well? 1 2 3 4 5 _____
6. Does the student share their project with enthusiasm? 1 2 3 4 5 _____
7. Is the project visually appealing and well organized? 1 2 3 4 5 _____
8. Does the student use correct grammar and spelling? 1 2 3 4 5 _____
9. Does the student answer questions about the project clearly? 1 2 3 4 5 _____
10. Does the student have a research log/journal? 1 2 3 4 5 _____ Total: /50

Comments:

_____
_____
_____
_____

Individual Science Fair Project Registration Form

Please neatly PRINT the following information below

Student's First and Last name _____ Grade _____

Teacher _____

Parent/Guardian Signature to approve of project below_____

Phone number or e-mail of guardian _____

Project Type: Choose only one for those in grades K-2

Grades K-2

_____ Model

_____Collection

_____Demonstration

_____Experiment (with or without the scientific method*)

Grades 3-5

Experiment using the scientific method

****The scientific method is explained in the Science Fair Packet, or can be found on Akin Road Elementary website under the activities menu, and then Science Fair Documents.**

Project Title: *for experiments, please state the title in the form of a question.*

_____

Summarize the plan for your science fair project below. Basic steps and materials that you will use should be included!

_____

_____

_____

_____

Will you need electricity? YES NO

Please return this form to the MAIN OFFICE BASKET by Thursday, December 15th