# 2015-2016

CASLV

*Soaring to Excellence*

# Science Fair Project Guide

Math, Science, and Technology play an important role in CASLV's mission. For this reason, all students will complete a science fair project this year.

Your task is to research, design, and conduct your own science fair project. In February, the best projects from each class will be evaluated by group of judges to select the winning projects in each grade. Those projects will go on to UNLV to represent Coral Academy in the Southern Nevada Regional Science Fair!

**3 Required Items**: This packet will serve as your **Science Fair Project Journal**. At the end of the project, you must turn in this packet (your **journal**), the final draft of your **Science Fair Report**, and your **Display Board**.

**Name:** _____

**Grade:** _____

**Teacher:** _____

# 2015-16 CASLV Science Fair Project Calendar

| *Date* | *What YOU need to do* |
|---|---|
| **START OF PROJECT**<br>*Monday, November 9th* | • Get this **packet**, put your name on it<br>• Keep it safe! Don't lose it! |
| **TOPIC and QUESTION DUE**<br>*Friday, November 20th* | • Select a **topic** that interests you (make sure it is not too broad or too narrow)<br>• Decide what **question** you want to answer about your topic |
| **BACKGROUND RESEARCH REPORT DUE**<br>*Friday, December 4th* | • **Research** your topic to become an expert about it |
| **HYPOTHESIS and DESIGN of EXPERIMENT DUE**<br>*Friday, December 18th* | • Based on your research, make a **hypothesis** (prediction) about the answer to your question<br>• Design an **experiment** to test your hypothesis ( to see if your prediction was correct)<br>• Gather **materials** needed for your experiment |
| **EXPERIMENT and COLLECTION of DATA DUE**<br>*Monday, February 1st* | • **Conduct** your experiment (repeat more than once if possible)<br>• Collect and record **data** (pictures, measurements, observations, etc) |
| **Complete ROUGH DRAFT of WRITTEN REPORT DUE**<br>*Tuesday, February 9th* | • **Analyze data** collected from your experiment<br>• **Decide** if the results of your experiment support your hypothesis and answer your question (or if they did not)<br>• **Present** your question, research, experiment, data, and conclusion in a written report (the "story" of your project) |
| **FINAL DRAFT OF REPORT AND DISPLAY BOARD DUE**<br>*Friday, February 26th* | • **Present** a summary of your project in an attractive, colorful, neat display board<br>• **Be creative!** |
| **CASLV SCIENCE FAIR**<br>*Tentative: Saturday, March 10, 2016* | • The top projects from each class are judged in the school-wide competition<br>• All projects are displayed |

# 2015-2016 CASLV Science Fair Project Rubric

| Category | 5 | 3 | 1 | Score |
|---|---|---|---|---|
| Question | The **question** is worded clearly, makes sense and can be answered through experimentation. | The **question** makes sense and can be answered through experimentation. | The **question** does not make sense OR can not be answered through experimentation. | |
| Comments: | | | | |
| Research | The **background research report** is through and clearly written in the student's own words, and includes a robust **list of sources** | The **background research report** is clearly written in the student's own words, and includes a **list of sources** | The **background research report** is written in language difficult to understand for a student, and no **list of sources** is included | |
| Comments: | | | | |
| Hypothesis | The **hypothesis** is clearly written to show what is predicted, and includes a research based **justification** for this prediction | The **hypothesis** is written clearly to show what is predicted, but includes a **justification** that is not supported by facts or research | The **hypothesis** is not written clearly to show what is predicted, and no **justification** is given | |
| Comments: | | | | |
| Experiment | Step-by-step **procedures** were followed, logical and clearly written. Specific list of **materials** is included. | Step-by-step **procedures** were followed. Some improvements were needed, such as more detail. A list of **materials** is included. | **Procedures** were unclear and not listed step-by-step. Little or no **materials** listed. | |
| Comments: | | | | |
| Data | **Data table** and **graph** are accurately labeled, drawn, and information is correct. | **Data table** and **graph** are somewhat accurately labeled, drawn. There may be information missing. | **Data table** and **graph** contain errors in labels, drawing and/or information. | |
| Comments: | | | | |
| Conclusion | **Results and Conclusions** show a clear and accurate understanding of knowledge gained from conducting the experiment. | **Results and Conclusions** show somewhat of a clear and accurate understanding of knowledge gained from conducting the experiment. | **Results and Conclusions** are unclear and do not show an accurate understanding of knowledge gained from conducting the experiment. | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| Display Board | The **Display Board** is complete, neatly written or typed, and shows effort and creativity. Pictures are displayed. **Presentation** was well planned and organized. | The **Display Board** is mostly complete, neatly written or typed, and shows some effort and creativity. **Presentation** was well organized and planned for the most part. | The **Display Board** is incomplete, sloppy, and shows little effort and creativity. **Presentation** was disorganized and planned poorly. | |
| Comments: | | | | |
| Written Report | The **written report** is through and clearly written in the student's own words, well organized, with few mechanical or grammatical errors, and includes all required elements | The **written report** is and clearly written in the student's own words, organized, with some mechanical or grammatical errors, and includes almost all required elements | The **written report** is and written in the in words difficult for a student to understand, with many mechanical or grammatical errors, and is lacking many required elements | |
| Comments: | | | | |
| Oral Presentation | The student spoke clearly, gave an informative **oral presentation**, and was able to clearly answer **questions** about their project | The student spoke somewhat clearly, gave an informative **oral presentation**, and was able to answer some **questions** about their project | The student did not speak clearly, did not give an informative **oral presentation**, and was able to answer few **questions** | |
| Comments: | | | | |

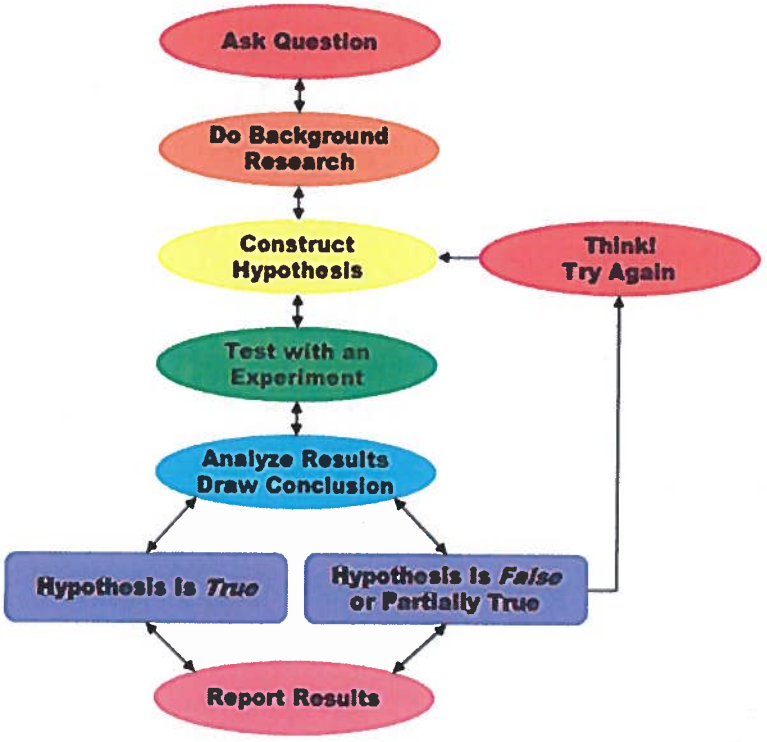
Total Score: _____

Comments:

# Overview of the Scientific Method

The scientific method is a process for experimentation that is used to explore observations and answer questions. Scientists use the scientific method to search for **cause and effect** relationships in nature. In other words, they design an experiment so that **changes to one item cause something else to change in a predictable way**.

Just as it does for a professional scientist, the scientific method will help you focus your science fair project question, construct a hypothesis, design, execute, and evaluate your experiment.




**Steps of the Scientific Method**

1. **Ask a Question:** The scientific method starts when you ask a question about something that you **observe**: How, What, When, Who, Which, Why, or Where?

   And, in order for the scientific method to answer the question, it must be about something you can **measure**, preferably with a number.

2. **Do Background Research:** Rather than starting from scratch in putting together a plan for answering your question, you want to be a savvy scientist **using library and internet research** to help you find the best way to do things and insure that you don't repeat mistakes from the past.

3. **Construct a Hypothesis:** A hypothesis is an **educated guess** about how things work:

   "If _____(I do this)_____, then _____(this)_____ will happen."

   You must state your hypothesis in a way that you can easily measure, and **your hypothesis should answer your original question** in step 1.

4. **Test Your Hypothesis by Doing an Experiment:** Your experiment tests whether your **hypothesis is true or false**. It is important for your experiment to be a **fair test**. You conduct a fair test by making sure that you **change only one factor at a time** while keeping all other conditions **constant** (the same).

   You should also **repeat your experiments several times** to make sure that the first results weren't just an accident.

5. **Analyze Your Data and Draw a Conclusion:** Once your experiment is complete, you **collect your measurements and analyze them** to see if your hypothesis is true or false.

   Scientists will often find that their hypothesis was false, and they will construct a new hypothesis starting the entire process over again in the future. Even if they find that their hypothesis was true, they may want to test it again in a new way.

6. **Communicate Your Results:** To complete your science fair project you will **communicate** your results to others in a **final report and a display board**. Professional scientists do almost exactly the same thing by publishing their final report in a scientific journal or by presenting their results on a poster at a meeting with other scientists.

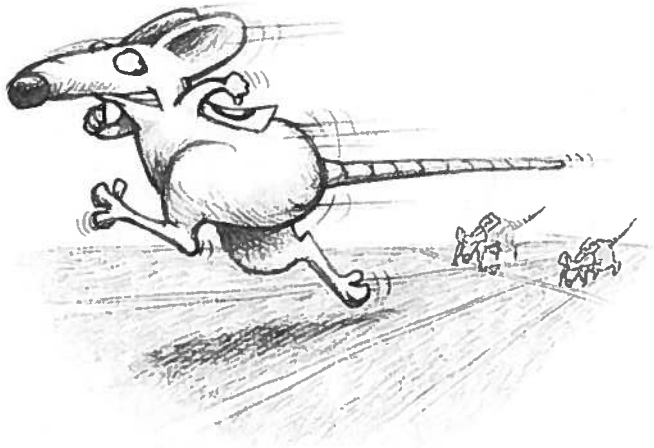
Even though we show the scientific method as a series of steps, keep in mind that **new information or thinking** might cause a scientist to **back up and repeat steps** at any point during the process.

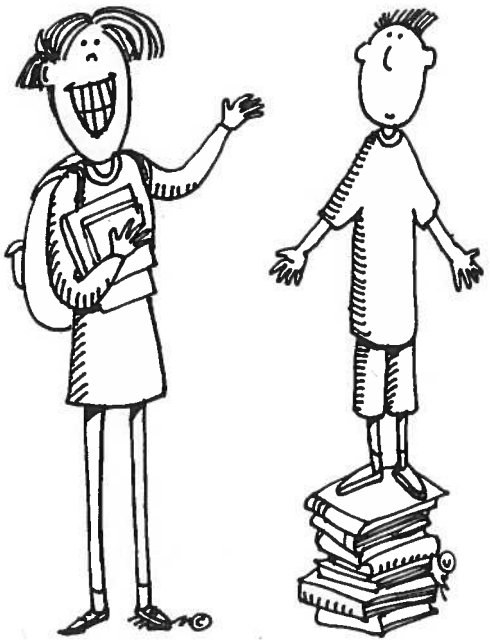
Throughout the process of doing your science fair project, you should keep a **journal** containing all of your important ideas and information. This journal is the **recorded history of every step of your project**, from brainstorming your ideas for topics, to writing your final conclusion.

For more detailed information on each step, check out:

http://www.sciencebuddies.org/science-fair-projects/project_scientific_method.shtml

# A note about projects involving experimentation on Animals or Humans





Any project involving animals or humans (for example, behavior of a rat in a maze) **must be approved** by the Local School Institutional Review Board (IRB) **BEFORE experimentation is done**. Contact your teacher if this applies to your project.

# Science Fair Project Web Resources

Here are some websites you may find helpful to you throughout the project.

**Discovery Education Science Fair Central**

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

**All Science Fair Projects.com**

http://www.all-science-fair-projects.com/

**Energy Quest**

http://www.energyquest.ca.gov/projects/

**Science Buddies**

http://www.sciencebuddies.org/science-fair-projects/

**Science Bob**

http://www.sciencebob.com/sciencefair/

**Education.com**

http://www.education.com/science-fair/

**Science Fair Projects.org**

http://www.sciencefair-projects.org/

**Juliana Trubin.com**

http://www.juliantrubin.com/sciencefairprojectsaz.html

# Selecting a Topic

Obviously you want a great project and to learn new things about science. These goals are possible, but to reach them you will have to spend a lot of time working on your project, so choose a topic that interests you. **The objective of a science project is to learn more about something in science that YOU are interested in.**

Your project doesn't have to be highly complex or complicated to be successful. You can develop and excellent project that answers very basic and fundamental questions about an event or situation encountered on a daily basis. There are many easy ways of selecting a topic.

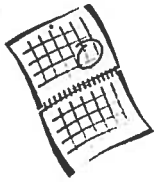
**Three Steps to Selecting a Topic**

The first step, coming up with your project idea, is the most important. **Just remember, you'll have a lot more fun (and probably learn more) if you start with at topic that interests you.** Here are a few hints for coming up with the project idea:

1. **Think of a topic that you are interested in.** *For example:*
   Space, Animals, Weather, Plants, Electricity, Rocks

2. **Focus on one aspect of one particular topic.** *For example:*
   Space: What is in the night sky?
   Animals: How can I best train my pet?
   Weather: How does the weather change?
   Plants: How can plants best be protected from animals?
   Electricity: How does electricity work?
   Rocks: What do the different colors in rocks mean?

3. **Make a specific question that you will design an experiment to answer.** What would you really like to figure out or show? Think of the most exact information you can discover and be very specific. *For example:*
   Space: How does our view of the night sky change over time?
   Animals: Does the length of an animal training session make a difference?
   Weather: How does a thermometer measure temperature?
   Plants: Can companion planting protect beans from beetles?
   Electricity: Which type of battery generates the most electricity?
   Rocks: How do you detect minerals in rocks?



# Science Fair Topic Selection Guide

**Using the previous page as a guide, list THREE possible topics for your science fair project.**

**GENERAL Science Topics that interest me:**

**TOPIC #**

1. _____
2. _____
3. _____

**One PART OR ASPECT of the topic that interests me:**

**TOPIC #**

1. _____
2. _____
3. _____

**One SPECIFIC QUESTION that you could design an experiment to answer:**

**TOPIC #**

1. _____
2. _____
3. _____

Now, select your favorite topic from your list of three possible topics.

## I am selecting topic # _____ for my science fair project.

**Your general topic:**

_____

**The specific part or aspect of the topic that interests you:**

_____

**Your specific question that you could design an experiment to answer:**

_____

**What is your purpose for choosing this topic (why did you select this topic instead of the others?)**

_____

_____

_____

_____

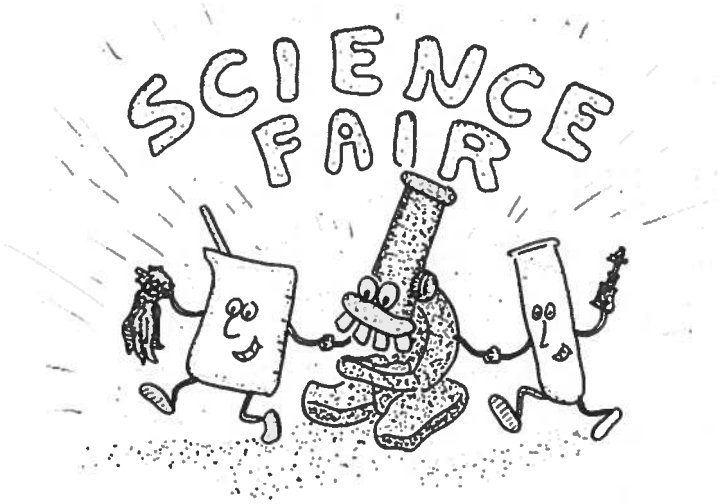
**What specific question will you attempt to answer through your project?**

_____

_____

_____

_____




**Teacher Approval** (Teacher's Initials) **:** _____

# Research

The purpose of research in a science fair project is to educate yourself about your topic before you create a hypothesis. Remember, a hypothesis is an "educated guess." The research is the education you need to make your educated guess!

**Here are some tips for conducting research:**

- Look for general information about your topic/question.

- Find others who have already experimented about a similar problem (prior research).

- Try to find information that applies directly to your question.

- Record the websites, books, etc that you look at so you can list them later. **This is called your Bibliography. Judges will be looking for your Bibliography!**

- Don't list Wikipedia or Wiki Answers/Yahoo Answers as your only resources.

- When you write your **hypothesis**, you will be stating what you think the answer to your question is (ex: A plant given orange juice will grow the tallest). **The research gives you the WHY (A plant given orange juice will grow the tallest *because* of the high sugar content of the orange juice).**

# Background Research Report

**A scientist must become an EXPERT in the field they are planning to experiment in.** Why do an experiment that someone else has already done? The goal of this research is to become knowledgeable in a field of science that you are interested in.

Once you have become an expert, you can make an intelligent prediction (hypothesis) about what will happen in the experiment you choose.

**Why did you select this topic? (Identify at least three reasons)**

1. _____
2. _____
3. _____
4. _____
5. _____

**List at least 3 interesting things you found out about your topic**

1. _____
2. _____
3. _____
4. _____
5. _____

# Resources


I located the information about my science fair project using the following resources (books, magazines, internet websites, interviewing an expert, etc.)

**Source #1:**

_____. (_____). _____

Author or Company Name | Date | Title of book or website

_____

Book publisher or web address

**Source #2:**

_____. (_____). _____

Author or Company Name | Date | Title of book or website

_____

Book publisher or web address

**Source #3:**

_____. (_____). _____

Author or Company Name | Date | Title of book or website

_____

Book publisher or web address

**Source #4:**

_____. (_____). _____

Author or Company Name | Date | Title of book or website

_____

Book publisher or web address

# Background Research Report

Using the details from you research, write a rough draft of you background research report. Your teacher will check for approval. After your teacher has given you the ok, include this research report as part of the final draft of your science fair project report.

First, you will create an introduction to your report. In 1-2 paragraphs, introduce your project by using its general topic, specific topic, the specific question you plan to answer, the reasons you chose your project, as well as some interesting facts you found about your topic.

If you get stuck, refer back to the background research you found.

**Introduction**

Next, you will write the rough draft of your background research report. Your research should include detailed information about your topic (the things you learned to become an expert). Pretend you are explaining the basics of your topic to a person with very little knowledge of it. Teach them the important facts.

Use your 3 or more resources you listed a few pages ago to help you. If you include information you found in your resources, it is helpful to also tell where you found the information as part of the report. This will make your report more professional.

**Background Research**

Use additional paper if necessary. Your teacher must check your background research report draft before you can continue.

**Teacher Approval** (Teacher's Initials) : _____

# Hypothesis

Remember, a hypothesis is an "educated guess" and your research provides the education for your guess.

Now you are ready to write your hypothesis. Here are some tips:

- **The question comes first.**
  - Before you make a hypothesis, you have to clearly identify the question you are interested in studying.
- **A hypothesis is a statement, not a question.**
  - Your hypothesis is not the scientific question in your project. The hypothesis is an educated, testable prediction about what will happen.
- **Make it clear.**
  - A good hypothesis is written in clear and simple language. Reading your hypothesis should tell a teacher or judge exactly what you thought was going to happen when you started your project.
- **Keep the variables in mind.**
  - A good hypothesis defines the variables in easy-to-measure terms, like who the participants are, what changes during the testing, and what the effect of the changes will be.
- **Make sure your hypothesis is "testable."**
  - To prove or disprove your hypothesis, you need to be able to do an experiment and take measurements or make observations to see how two things (your variables) are related. You should also be able to repeat your experiment over and over again, if necessary.

  To create a "testable" hypothesis make sure you have done all of these things:

  - Thought about what experiments you will need to carry out to do the test.
  - Identified the variables in the project.
  - Included the independent and dependent variables in the hypothesis statement. (This helps ensure that your statement is *specific* enough.)
- **Do your research.**
  - You may find many studies similar to yours have already been conducted. What you learn from available research and data can help you shape your project and hypothesis.
- **Don't bite off more than you can chew!**
  - Answering some scientific questions can involve more than one experiment, each with its own hypothesis. **Make sure your hypothesis is a specific statement relating to a single experiment.**

## Examples of Narrowing your Hypothesis from General to Specific

**Example 1:** A worker on a fish-farm notices that his trout seem to have more fish lice in the summer, when the water levels are low, and wants to find out why. His research leads him to believe that the amount of oxygen is the reason – fish that are oxygen stressed tend to be more susceptible to disease and parasites.

He proposes a general hypothesis.

> *"Water levels affect the amount of lice suffered by rainbow trout."*

This is a good general hypothesis, but it gives no guide to how to design the research or experiment. The hypothesis must be refined to give a little direction.

> *"Rainbow trout suffer more lice when water levels are low."*

Now there is some directionality, but the hypothesis is not really testable, so the final stage is to design an experiment around which research can be designed, a testable hypothesis.

> *"Rainbow trout suffer more lice in low water conditions because there is less oxygen in the water."*

This is a testable hypothesis – he has established variables and by measuring the amount of oxygen in the water, eliminating other controlled variables such as temperature, he can see if there is a correlation against the number of lice on the fish.

This is an example of how a gradual focusing of research helps to define how to write a hypothesis.

**Example 2:** If you put an ice cube on a plate and place it on the table, what will happen? A very young child might guess that it will still be there in a couple of hours. Most people would agree with the hypothesis that:

> *"An ice cube will melt in less than 30 minutes"*

You could sit and watch the ice cube melt and think you've proved a hypothesis. But you will have missed some important steps.

For a good science fair project you need to do quite a bit of research before experimenting. Start by finding some information about why water melts. You could read a book, do a bit of Google searching, or even ask an expert. For our example, you could learn about how temperature and air pressure can change the state of water. Don't forget that elevation above sea level changes air pressure, too.

Now, using all your research, try to restate the hypothesis.

> *"An ice cube will melt in less than 30 minutes in a room at sea level with a temperature of 68 degrees F."*

But wait a minute. What is the ice made from? What if the ice cube was made from salt water and you sprinkled salt on a regular ice cube? Time for some more research. Would adding salt make a difference? Would other chemicals change the melting time?

> *"An ice cube made with tap water will melt in less than 30 minutes in a room at sea level with a temperature of 68 degrees F."*

This is a testable hypothesis that can be confirmed or not confirmed by your results.

# Experiment

A good experiment starts with a good plan. Come up with an organized plan for your experiment and execute it. Make detailed observations (things you can observe) and record data (things you can measure). When you are all done, repeat the experiment multiple times if possible to strengthen your results.

**Writing the Procedure**

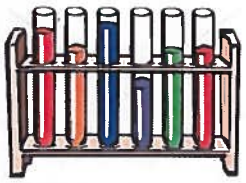
- Write the **experimental procedure** like a step-by-step recipe for your science experiment. A good procedure is so detailed and complete that someone else could repeat your experiment exactly...without your help!
- Make sure you have all necessary **materials and supplies BEFORE starting**.
- Think about **SAFETY** ahead of time. What steps may be dangerous?

**Executing the Experiment**

- **Prepare data tables** ahead of time so you can easily write down **measurements** and **observations** during the experiment
- **Follow your procedure exactly** to avoid changing the results. If you do change the procedure, **write down what you did differently** and include it in your written report.
- **Be consistent, careful, and accurate** when you follow the steps and take measurements. It is generally better to have a measurement than an observation ("The balloon got bigger" vs. "The balloon's circumference increased by 30 cm")
- **TAKE PICTURES** to document your experiment (they're worth 1,000 words!)

**Repeating the Experiment**

- In order to have good/robust/solid data and results, **you need to repeat your experiment multiple times**. Just because something works the first time doesn't mean that it will work the second, third, fourth...
- You can repeat the experiment in a variety of ways:
    - **Executing the experiment multiple times with the same supplies** (ex: running a car down a track over and over)
    - **Executing the experiment on multiple subjects at the same** time (ex: growing six different plants in different pots at the same time)
    - **Executing the experiment on multiple subjects at different times** (ex: giving many people the same test on different days)



# Design of Experiment

## Hypothesis

State your hypothesis about your specific topic. Fill in the blanks to create a testable and well thought out hypothesis.

For example, **IF** *I leave a wet black towel and a wet white towel in the sun*, **THEN** *the black towel will dry first due to dark colors absorbing heat better.*

**IF** _____,

**THEN** _____.

## Experiment

**Materials and Equipment** – List all items that will be used in your experiment. Add additional lines if necessary.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

**Procedure** – List all the steps in your experiment procedure in as much detail as you can. Remember, this is similar to a cooking recipe. You need to include every detail to make sure someone else can understand what steps you took and can verify that your results are accurate. Add additional lines if necessary.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

**Once your teacher approves your procedure, you may begin your experiment**

**Teacher Approval** (Teacher's Initials) : _____

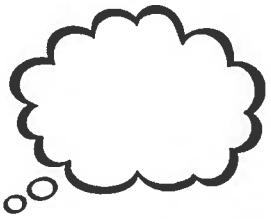
# Collection of Data

As you complete your experiment, record your data and observations on these pages. Create graphs, charts, or any graphical representation of your results as well. You may draw them or print them out and paste them in to this booklet if you want. Add in additional pages if necessary.

Draw or Paste your Data Table/Graphs here

**Teacher Approval** (Teacher's Initials) : _____

# Data Analysis and Conclusion



**Did you experience any problems?**

(List any problems or difficulties that you encountered during the experiment)

1. _____
2. _____
3. _____

**Would you do anything differently?**

(List anything that you had to do differently or would like to do differently next time)

1. _____
2. _____
3. _____

**Did you anything surprise you?**

(List anything that surprised or amused you during the experiment)

1. _____
2. _____
3. _____

**Did your experiment generate any new questions?**

(List any additional questions you would like to investigate further)

1. _____
2. _____
3. _____

**Did you notice any patterns in your data?**

(List any patterns you noticed as you collected your data, either expected or unexpected)

1. _____
2. _____
3. _____

**Is there anything in your data that can't be explained?**

(List any parts of your data that don't make sense)

1. _____
2. _____
3. _____

# Conclusion

**My hypothesis was (rewrite your hypothesis here):**

_____

_____

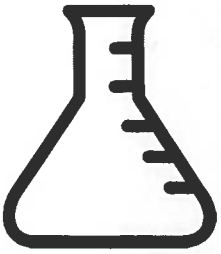
_____

**The results of my experiment DO or DO NOT (circle one) support my hypothesis because:**

_____

_____

_____



# Science Fair Project Report

**Note**: the Introduction and Background Research Report you did earlier are also part of this rough draft, so don't forget them when you type your final draft.

Think of this as a **personal narrative** to describe your story of your science fair project.

Next you will describe your **experiment procedure** in great detail. Be sure to begin with a catchy introduction sentence, include the **material, equipment**, and the **steps you took** to complete your project.

**Experiment Procedure**

Next, you will describe the results of your project. Once again, begin with a catchy introduction sentence, describe what happened during the experiment, and end with a conclusion that wraps up your thoughts.

Be sure to use lots of detail and look at your data tables and graphs to help you as you write.

**Experiment Results**

Last you will describe the conclusion of your project. Once again begin with a catchy introduction sentence, identify problems you may have encountered, things you might do differently next time, any surprises, and any questions you still have. As always, end with a conclusion sentence that wraps up your thoughts.

Look back at your Data Analysis and Conclusion sheets if you need ideas.

**Conclusion**

Use additional paper if necessary. Your teacher must check your rough draft before you can continue.

**Teacher Approval** (Teacher's Initials) **:** _____

# Abstract

Now that you have completed your experiment and the rough draft of your science fair report, you can write an abstract of your project.

An **abstract** is a one paragraph (or at the most one page) summary of your entire project, including the results of your experiment and your conclusions. It is a way for someone to get the overall picture of what you did in a short, easy to understand format.

The abstract will actually be placed near the front of your report when you do you final draft. Use the lines below to draft your abstract.

**Abstract**

# Revise/Edit Rough Draft

**It is time to review your rough draft for errors.**

**Use the following checklist to check your work. Mark each category as you complete it. Now, select your favorite topic from your list of three possible topics.**

| Student Review | Parent Review | Editing Checklist |
|---|---|---|
| ❑ | ❑ | Read your rough draft out loud to yourself and to an adult |
| ❑ | ❑ | Are paragraphs indented and headings used? |
| ❑ | ❑ | Are there spelling errors? |
| ❑ | ❑ | Is the punctuation correct? (Periods, commas, capitalization, etc.) |
| ❑ | ❑ | Do your sentences and paragraphs make sense? |
| ❑ | ❑ | Do your sentences and paragraphs flow together in a logical way? |
| ❑ | ❑ | Did you use interesting and engaging words to describe you project? |
| ❑ | ❑ | Did you use topic sentences, details, and conclusions properly? |
| ❑ | ❑ | FINAL APPROVAL (BOTH STUDENT AND PARENT CHECK) |

**Parent or other adult's signature to begin final draft:** _____

Before you can begin the final draft you need your teacher's approval as well.

**Teacher Approval** (Teacher's Initials): _____

# Final Draft

Here is a list of what you need in your final draft (in this order):

1. Title Page (Including the Project Title, your name, and your grade)
2. Table of Contents (showing the page number of each item in your final draft)
3. Abstract
4. Introduction
5. Background Research Paper
6. Equipment/Materials List
7. Experiment Procedure
8. Experiment Results (Including Data Tables and Graphs)
9. Data Analysis and Conclusion
10. Bibliography (List of References)


# The Display Board

- Your science fair display represents a **summary** of all the work that you have done.
- It should include **labeled sections** called: **Question, Hypothesis, Experiment (materials and procedures), Results (data and analysis), and Conclusion**
- It should be a on a **folding display board** (can be purchased from an office supply store, Wal-Mart, Target, etc)
- The **maximum size 48 inches wide by 38 inches high** (see "Student's Science Project Display Guidelines & Rules" for more info)
- The **text** on the board should be **computer printed** or very carefully hand written
- The **titles** could also be letters purchased from a craft store
- The board should be **colorful, neat, and organized** so it attracts the attention of viewers but does not confuse them
- The board should include **graphs or charts** of your data
- The board should include **pictures** of your experiment if possible

**IMPORTANT:** BEFORE YOU GLUE/PASTE/STENCIL/WRITE anything on your board, lay everything out and see if it fits well. Make any changes you need to before it's too late!

**Here are the items that should be on your final display board:**

| | | |
|---|---|---|
| **Title:** Name of the Project, preferably written in a catchy or interesting way | **Bibliography:** A list of the books and websites you used for your project | **Results:** Graphs or charters showing what happened after you conducted the experiment |
| **Purpose:** Reason for the project…your question, what you want to find out | **Materials**: A list of supplies and equipment you used in the experiment | **Conclusion**: Telling what happened… Did it work? What did you learn? Did your results support your hypothesis? |
| **Hypothesis:** A prediction that you make of the results before conducting the experiment | **Procedure**: The steps or directions that you used to conduct the experiment | **Pictures**: Show your project and experiment in action (try to avoid student's faces in the pictures) |

**The exact arrangement of these items is your choice, but you should include all of them.**