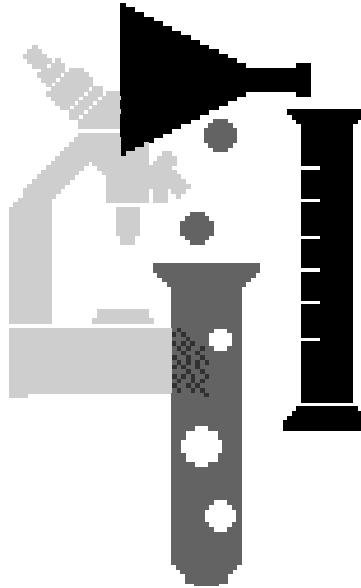


Socorro High School



Science Project Requirements Manual

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Purpose

The ultimate purpose of the independent research project is to develop a better, more skilled science student that has learned basic research and problem solving skills. This manual is to assist the student with various parts of the project--beginning with the selection of the research topic and ending with its development into a formal presentation.

Objectives

In order to learn these basic skills, students will be expected to perform library and internet research, perform a controlled experiment and collect data, present their findings in written form, and develop a formal presentation.

How to Pick a Science Project

One of the most crucial steps in performing an independent research project is that of picking a topic that is interesting, challenging, at an appropriate level, and has plenty of information to aid in its development. Choose something that you are interested in and something you want to learn more about. It will be necessary for you to speak to different people, such as teachers, librarians, and professionals in your area of interest. Also, make good use of the library and internet. For your convenience, a few internet addresses are listed below to give you a start.

www.sciencedaily.com
www.usc.edu/CSSF/History/1998/By_Category.html
www.sciencegems.com/
www.umi.com/proquest(password required; see librarian)
http://www.ipl.org/youth/projectguide/
www.parkmaitland.org/sciencefair/index.html
http://nesen.unl.edu/teacher/
dogpile.com
google.com
http://share3.esd205.wednet.edu/mcillend/SSP.html
http://www.usc.edu/CSSF/Resources/Getting Started.html
http://www.scifair.com/2002winners.html
http://www.scienceproject.com/
http://www.sciserv.org/isef/students/rules/src.asp

STEPS IN THE SCIENTIFIC METHOD

“A common misperception of science is that it defines ‘truth’. Science is not truth, but rather it is a way of thought. It is a process by which experimentations is used to answer questions. This process of experimentation is called the scientific method and involves several steps.” (Carpi, Anthony. Learning Tower Homepage. The Leaning Tower of Pisa, 1998-1999.)

Scientific Method: scientific problem solving done in a systematic manner.

Step 1: State the Problem

(Know the question your are trying to answer/solve.)

Step 2: Gather Information on the Problem

(Know some background on the problem; research.)

Step 3: Make a Hypothesis

(Make an educated guess about the question’s answer. **It is a good idea to make this a general statement.** For example: If a penny is flipped twenty times, then heads will fall most often.)

Step 4: Experiment

(Test your hypothesis; try it out. **Note: You will be asked to have a minimum of 10 trials for your testing. This will give you a significant number of trials to work with when working with the results.**)

Step 5: Collect/Record and Analyze Data

(Write down the observations. This should be done on a chart of some sort. Use graphs to visually represent your data. It will be imperative that you have these on your research paper as well as your science presentation board. Study it to make sense of it.

Note: The Results are the written explanation of your Data; these are not the same as the Conclusion!)

Step 6: Conclusion. Using some elaboration

- A. Restate the hypothesis
- B. Finding support hypothesis
- C. Explain what results mean, interpret findings
- D. Final summary of project
- E. Suggestions for improving project
- F. Main Conclusion

Steps 7: Repeat Your Work

Controls and Variables

It is important that the student learn how to perform a proper experiment--one in which there is a control. This is called a **controlled experiment**. In order to have a controlled experiment, the student needs to assign **variables**. However, there can be different types of variables, such as those listed below.

Variables:

- 1) Constants (Controlled Variables):**
Items which remain the same (unchanged) throughout the experiment; factor(s) that do not vary in an experiment.
- 2) Independent (Manipulated) Variable:**
Item being tested; the item which varies; the only item which is different in an experiment; that item in an experiment which affects the outcome; the factor adjusted by the experimenter.
- 3) Dependent (Responding) Variable:**
Factor whose value depends upon the value of the independent variable; results.

Set-Up:

- 1) Control:**
Part of the experiment used as a standard for comparison. It is **predictable**.
- 2) Experimental:**
Part of the experiment containing the item tested. **Not predictable**.

Structure of a Controlled Experiment

Control Set-Up	Experimental Set-Up
Does not have the item tested. Otherwise, everything is the same as the experimental set-up. It is <u>predictable</u> .	<u>Does</u> have the item tested. Otherwise, everything is the same as the control set-up. It is <u>not</u> predictable.
Example: 10 plants without fertilizer.	Example: 50 plants with differing amounts of fertilizer.

Format for a Lab Report (Research Plan)

A lab report communicates to others what you have done. Therefore, it should be detailed enough for someone to follow and repeat your experiment. Never assume that someone knows what you are speaking about if you do not write it down.

- NOTE:**
1. A research plan and a lab report are very similar. When you are in the process of planning your experiment, you will be asked to write a research plan. On the other hand, you will be asked to write a lab report after you have done an experiment. While both follow the same basic pattern at the beginning, they have some differences after the variables.
 - a. **A research plan will not include a table for your observations. Nor will it contain a conclusion. Remember, this is done before you experiment.** The research plan below reflects what you will be required to turn in for the S.H.S. Science Fair, S.I.S.D. Science Fair, and Sun Country Regional Science Fair. Once you do one for the school fair, you will not need to do another one for the other fairs, **so save your plan.**
 - b. **A lab report will have observations, and it will have a conclusion. This is done after you experiment.**

Problem: The question you need to answer.

Hypothesis: Your educated guess.

Materials: Equipment/tools you need to use.

Procedures: Steps/directions you need to follow. These should be numbered and in sequence.

- 1.
2. (etc...)

List:

Variables: (See Variables section for more details.)

- 1) **Constants (Controlled Variables):**
- 2) **Independent (Manipulated) Variable:**
- 3) **Dependent (Responding) Variable:**

Set-Ups:

- 1) **Control:**
- 2) **Experimental:**

Sources: (Bibliography) At least 5 sources needed for district and/or regional science fair. Only 1 internet source and no encyclopedias
Examples of sources: proquest, scientific journals, etc.

Log Book (Journal) Requirements

It is imperative that you document all measurements and observations in a separate notebook referred to as **log book** or **journal**. Record information on a daily basis and consider the following things that are required:

- * Make sure that your data is measured using S.I. Units (metrics).
- * Write all your observations down. Be detailed. Keep lots of notes because it is better to have too much information than not enough.
- * Always include the dates and times of your observations.
- * Keep track of the material used, their quantities and cost.
- * **Do take pictures** to be included in your display and research paper.

Use the following format:

Date:		Time:	
Measurements:			
Observations:			

Note: Your guardian's signature is required on the front of your journal. You will not receive credit unless it is signed.

Locating Sources

The topic you choose for your science paper should interest you. Therefore, you should know some information about the topic. You are the first source of information. Begin by listing the information that you already know about the topic. This will help you decide what you need to focus your research on and show you how much you really know.

Once you have a list of the key ideas that you need to research, you may begin. We've listed a few of the places where you can find information.

Library

No other place contains books, magazines, special catalogs, encyclopedias, science-related reference books, and manuals. Make sure to check the non-fiction area, the periodicals area, and the reference area. Make sure that the materials you are using are not outdated. Always look at the copyright date.

Internet

The internet is useful, fast, and there's more information than you probably need. Beware of internet sources because they are not always reliable. Always check the source of the article that you're reading on the internet. Is the writer/organization well-known and reliable? Is the information supported by research, statistics, etc.?

Personal Interviews

There are many people who can be considered experts. Your job is to find the right person. Consider speaking to science teachers at school or at the university. Find people whose career is related to your topic or people whose hobby is related to your topic.

When conducting an interview, make sure to have your questions pre-checked by a teacher, a tutor, etc. Consider taking a recorder to the interview. Dress and act professionally during the interview and don't forget to send a thank-you card.

Brochures and Pamphlets

Many companies produce informational brochures that may be of help to you. For example, if your project is related to water, contact the El Paso Water Utilities education division. It may take time to receive the information from them, so don't procrastinate.

Television, Radio, and Printed News

Keep your eyes and ears open for programs or articles that relate to your topic. Write notes as you listen to the program or read the news and remember to write all the source information.

Documenting Your Sources

Terms to Know:

Document – (v.) to write down all the important information about a topic.

Source – (n.) any book, document, article, etc. that you are using in your research

Cite – (v.) to write down the bibliographic information of your source

Summary – (n.) information that is read and re-written in your own words.

Quote – (n) information that is copied directly (word for word) out of a source

When you are researching information for your science project and your science paper, you will find lots of information. Some sources will be more useful than others. You will be required to write the important information that you find in your sources on notecards. Your notecards may contain two types of notes:

Summary Information

Quoted Information

Summary Information Note Cards

The front of your note card must contain the topic of information and the information about your topic. You may write between 1 and 5 sentences on the front of your note card.

The back of your note card must contain the title of your source and the page number where you found the information.

Quoted Information Note Cards

It is important that you learn that it is unethical to present the words of others as if they were your own. In other words, you must not copy information from a book and then type it into your paper as if you had created the sentences yourself. It is not wrong to copy information from a book, as long as you state in your note cards and in your science paper that someone other than you wrote those sentences.

The front of your quote cards must contain the information from the source. Remember that it is ok to copy the sentence or paragraph exactly as it appears in the source.

The back of your quote card must contain the source title, author, page number where the information was found, the name of the publishing company, the city of publication, and the year of publication. This information is found on the page opposite the title page of books.

Writing Note Cards

Step One

Brainstorm topics you can research

Step Two

Locate sources with information on the topics from Step 1

Step Three

Get an index card and make a bibliography card (follow the format below)

***Complete this step for each new source**

1. Write the name of the book
2. Write the name of the author
3. Write the city, state, or country the book was published in
4. Write the name of the publisher
5. Write the copyright year
6. Write the call number of the book
7. Write the page numbers of the book you will be using
If it is the whole book, write that

Step Four

Summary note cards reduce information and are written in your own words.

Get an index card and write information.

- one fact per card
- you do not need to write in complete sentences

1. Write a fact in the middle of the card.
2. Write the last name of the author (if there is no author, abbreviate the title of the book) and the page number on the bottom of the card (bottom right hand side.)
3. At the top of the card, write a title that describes the fact.
Example: If the information describes the appearance of copper, write *Copper Appearance* on top

Quote note cards

A quotation consists of the exact words from a source. On your quote card, put a quotation mark (“) at the beginning and the end of the quote (you may later forget it was a quote). If you are writing something someone other than the author said, you must write down the person’s name on the card.

Parts of the Science Paper

Title Page

- I. Abstract (no more than 250 words)
 - A. Importance (relevance to society, who project will help)
 - B. Purpose/Problem (what you are trying to prove)
 - C. Hypothesis (what you think will happen)
 - D. Materials & Method Summary (2 to 3 sentences)
 - E. Main Findings (results after you tested)
 - F. Concluding Sentence (may be similar to first sentence or be a final statement about your project.)

- II. Introduction (approximately 8 to 10 paragraphs)
 - A. Importance/Relevance of Project
 - B. Purpose/Problem
 - C. Hypothesis
 - D. Summary statements over research/topic
(Letters A,B,C, & D above make up your first paragraph)
 - E. Background information
 1. Look to your note cards to determine your main points. For each of your note cards, the information under Roman Numerals will be at least one paragraph long.

NOTE: The topics include in background information: history, past and current studies/experiments, detailed description of types, uses relevance to scientific community, future scientific relevance (how it will improve society), and related research topics.

- III. Materials & Method (separate into sections, include one sentence introduction)
(see sample)
 - A. Materials
 - B. Method
 - C. Design Weakness
 - D. Variables/Control

- IV. Results (should be computer generated tables and graphs with a title)
(must include 3 to 5 items in this section)
 - A. Illustration 1
 1. title
 2. one sentence explanation
 - B. Illustration 2
 1. see above
 2. see above

- C. Illustration 3
 - 1. see above
 - 2. see above
- D. Illustration 4
 - 1. see above
 - 2. see above

ILLUSTRATIONS ARE PICTURES, LINE GRAPHS, TABLES, DRAWINGS, ETC...

V. Discussion

- A. Explain each result individually.
- B. Unusual, important observations.
- C. Errors/design weaknesses affecting project.
- D. Concluding sentence.

VI. Conclusion

- A. Restate hypothesis.
- B. Findings support hypothesis?
- C. Explain what results mean, interpret findings.
- D. Final summary of project.
- E. Suggestions for improving project.
- F. Main conclusion.

VII. Glossary

- A. List of unfamiliar words.
 - 1. Look for introduction for possible words.

VIII. Appendix

- A. Pictures
- B. Surveys
- C. Diagrams

IX. Works Cited (bibliography)

- A. List of sources used to write paper.
- B. Must follow American Psychological Association (APA) format.

The Appearance of Your Scientific Paper

The presentation of your scientific research paper is very important. You must present your best work and present it in an attractive and organized manner. Use the following guidelines.

1. Type your scientific paper using Microsoft Word. This program is available in the Socorro High School computer lab. Use the grammar feature to correct mistakes. Spell check!
2. All the text must be printed in 12-pt. size. All titles must be printed in 16-pt. size. Use Times New Roman font only.
3. The title page must have your project's name, your name, classification, and the date of presentation.
4. Print your paper clearly.
5. Organize your scientific paper in the order specified in the Table of Contents.
6. Present your paper in a clear plastic cover.
7. Avoid folded pages, smudged ink, and anything else that makes your paper unattractive. Reprint if you have to.

Title Page

Project Title in 24-pt. bold centered in the center of the page.

When writing the title:

- Do not write it in the form of a question
- Try to keep it short (under 5 words)
- Make sure it describes your project, but don't be afraid to be creative.

In the lower right hand corner in 14-pt. bold, include:

- Name (First, Middle Initial, Last)
- 1st or 2nd year project (If this is a continuation project from a previous year, type 2nd Year Project)
- Site where the experiment was done (write the complete address of your home, of SHS, or of whatever location you used for conducting your experiment)

Table of Contents

After your title page, you should have table of contents. Just as it does in a textbook, the scientific project paper table of contents will help readers locate individual sections easily. The table of contents should list all sections of your paper. It is up to you how you want to arrange the table of contents; make sure that all entries in the page are typed in the same format. The following example presents the title of the page, dots, and the page number where the Abstract is found.

Example:

Abstract.....1

Directions:

Table of contents title must be in 14-point bold text, centered at the top of the page.

Titles and page numbers must be in 12-point size.

The entire page must be justified on both the left and the right sides.

Your table of contents must list all of the following sections in this order:

Abstract
Introduction
Materials and Methods
Results
Discussion
Conclusion
Glossary
Appendix
Works Cited

Abstract

This section of your paper is perhaps the shortest and most important section of your paper. It is usually a maximum of 250 words, and written as one paragraph. You may write in first person.

The abstract section serves as a table of contents or map to your entire paper. The Abstract contains a bit of information from each section of your paper. The following outline will help you include all of the necessary information.

Suggested Outline:

Sentence 1:	Importance (relevance to society, who this project will help)
Sentence 2:	Purpose/Problem (what you're trying to prove)
Sentence 3:	Hypothesis (what you think will happen)
Sentence 4-6:	Materials and Method Summary (2 to 3 sentences)
Sentences 7-8:	Main Findings (results after you tested)
Sentences 9-10:	Concluding Sentences (may be similar to the first sentence or serve as your final opinion or as a summary regarding the project)

Remember to limit your Abstract to 250 words.

Introduction

This section of the paper is the longest. It is similar to papers you write in English class. The introduction contains all the information you gathered from the research process. When writing this section, think of everything that you have learned about good writing skills.

Directions:

Write this section in third person. The tone is serious and formal. Do not use contractions or slang.

Each paragraph should have between five and seven sentences. Some paragraphs will have more than seven sentences.

The body paragraphs of your paper should begin with transitions.

Choose a verb tense and be consistent. If you write in present tense, use present tense throughout the paper. If you write in past tense, use past tense throughout the paper.

Your paper should include one quote from each of your sources.

Remember that TCQC works well for these paragraphs.

I Have My Note Cards, Now What?

Writing the Introduction Outline

Terms to Know:

Main Idea – The most important point of the paragraph. It explains the central idea that the reader needs to understand. The main idea is also called the topic.

Topic Sentence – One sentence that tells the reader what the main idea of the paragraph is. Each paragraph should have a topic sentence.

Concluding Sentence – The final sentence in the paragraph that restates the main idea of the paragraph.

Step One

Separate your note cards into groups by topic. For example, all the cards that tell you what copper looks like would be in one group. All the cards that tell you what copper is used for would be in another group. Each of these groups of note cards will eventually become a different paragraph in your introduction.

Step Two

Organize your groups of cards. Give each group a title (the title should reflect what all the cards have in common. Example: Group one is titled “Appearance of Copper.” Group two is titled “Uses of Copper”).

Decide the best order for your paragraphs. You do this by deciding which group of cards should be discussed first in your paper. Remember that each group of cards equals one paragraph.

Step Three

Write an outline using Roman Numerals, letters, and numbers.

Each topic (group of cards) from step 2 will become a Roman Numeral.

Each group of cards needs to be divided into smaller sections; these sections become letters in the outline.

Write down the facts that describe each letter. These facts are numbers in you outline.

Step three will help you realize which areas need more research.

Step Four

Begin writing the introduction section (follow the format below)

1 st sentence	Start with a topic sentence (look at your Roman Numeral.)
2 nd -5 th sentences	Include facts from note cards (describe your Roman Numeral.)
6 th sentence	Concluding sentence, restate the main idea from your first sentence and introduce your next paragraph's main idea.

Notes:

- *You may use 3rd person pronouns (he, she, it, one)
- *Try to use all information from the note cards
 - remember to use direct quotes as well as paraphrases
- *Do not use 1st person phrases such as "In my science project"
"In this paragraph"
"Well, I will talk about"

Editing Your Introduction

Your science paper must be closely edited before you print the final copy. Editing eliminates spelling errors and ensures the best science paper possible.

The following is an editing checklist. Edit your paper on your own, and then have someone else edit it. Write your initials on the blanks below once you have edited your paper and made sure that all of the following points are correct. It is extremely important that your paper have correct grammar, spelling, etc.

____ Are all words spelled correctly? Have you used the spell-check feature? Are names spelled correctly?

____ Do you have 5-7 sentences in each paragraph?

____ Are most of your sentences compound or complex?

____ Is every sentence a complete thought?

____ Is every idea clearly explained? Are the ideas in your paper related to each other?

____ Are your sentences grammatically correct? Did you fix the errors found by the grammar-check feature?

____ Do you have transitions? Are they followed by a comma and used to introduce new paragraphs?

____ Have you avoided first person pronouns? All your writing in the introduction must be in third person.

____ Are all your verbs in the same tense? Write either always in present tense or always in past tense.

____ Do you have one quote from every source?

____ Is the tone of your paper serious and professional? Have you avoided slang and a friendly tone?

Adding Quotes to Your Introduction

Most of the sentences in your science paper must be sentences that you created yourself. They may be sentences that you created by summarizing information from your sources. It is a good idea, however, to add some quotes to your science paper. Quotes are sentences that were copied directly from the source. Remember that it is ok to copy sentences directly out of the source and into your paper as long as you state clearly that someone, other than you, wrote those words.

Quotes must be about the topic that is being discussed in the paragraph. You must have one quote from every source.

Once you have found the information that you want to quote and have found the perfect place for your quote, you are ready to do In-Text Citation. This sounds complicated, but it is actually very easy. You need to know the author of your quote and the page number where you found the quote. You should have this information written on your quote card. Follow these easy steps.

1. Decide how long your quote is. Is it a few words? A sentence? A paragraph?
2. Type your quote into the paper.

If your quote is not a complete sentence, put quotation marks around the information. At the end of the sentence, type the author's last name and the page number where the quote was found. Surround this information with parenthesis. Place a period after the closing parenthesis; this will serve as the ending punctuation for your sentence. Example (**Lopez 45**).

If your quote is an entire sentence, you do not need quotation marks. Simply add the bibliographical information in parenthesis at the end of your sentence.

If your quote is a complete paragraph, add the bibliographical information at the end of the last sentence. Remember that you only need one punctuation mark at the end of the sentence and that it belongs after the last parenthesis.

Remember to do this for all quoted information.

Materials and Methods

This section of your paper deals with the experiment process, the items and steps that you used in your experiment. It is necessary to write down all the supplies that were used to complete the experiment as well as a step-by-step listing of the process used. Your goal in creating this section of the paper is to make it possible for someone else to replicate your entire procedure without any problems. A sample Materials and Methods page is presented here for you.

Directions:

At the top of the page, type the words 'Materials and Methods' (capitalize the major words) in 14-point bold, centered text.

In 12-point bold text, write the word 'Materials' next to the left margin.

Using 12-point text, make a list of every item that you used in the experiment. You may number this list if you wish. Be sure to include the quantities of each item.

Repeat the typing for the 'Methods' section

Along the left margin, type the words 'Design Weakness' in 12-point, bold text.

Write a one-sentence explanation of the weakness in the project.

Along the left margin, type the word 'Variables' in 12-point, bold text.

List all of your variables as they appear on your checked research plan.

SEE A SAMPLE 'MATERIALS AND METHODS' ON THE NEXT PAGE

This is a sample; please read the instructions on the previous page before continuing.

Materials and Methods

Materials

For this experiment, you need:

1. One 1-liter bottle
2. 65 grams of salt
3. 50 liters of water
4. Triple beam balance
5. 10 people from the ages of 14 to 20

Method

To complete this experiment, follow these steps:

1. Fill a 1-liter bottle with water.
2. Give the water to your test subject and instruct him/her to swish the water in his/her mouth.
3. Record whether he/she tasted salt or not.
4. Empty the water and fill again.
5. Add 1.5 grams of salt to the water and shake
6. Give the water to your test subject and instruct him/her to swish the water in his/her mouth.
7. Record whether he/she tasted salt or not.
8. Repeat steps 4-6 with 2.5 grams, 0.5 grams, and 2.0 grams of salt.
9. Repeat steps 1-6 with the 9 other test subjects.
10. Record results.

Design Weakness

If a test subject did not fully rinse out his/her mouth, residue from other foods may have affected the tasting.

Variables

All variable are controlled except for the swishing of the water in the mouth.

Results

This section of the paper describes what happened after you tested your problem. It is not written in paragraph form. Instead, you take the data collected and find a visual way to present it. For example, you could use a table, before-and-after diagram, circle graph, bar graph, line graph, etc...

Include a title for each illustration and a one-to-two sentence explanation of what the reader is seeing. Also, if a key is needed, do not forget to include it. Try to use a color printer; otherwise, expect to color your illustration to make them look better.

Discussion

In this section of the paper, describe your findings in paragraph form. Include all results. For instance, if you tested 10 people, you must describe what happened to each of those ten people after testing.

Use the results section of your paper to assist you.

Directions:

Explain each result individually and in great detail.

Describe unusual and important observations.

State how errors or design weaknesses affected the project.

Write a concluding sentence which summarizes your main findings.

Conclusion

Using some elaboration,

- A. Restate hypothesis.
- B. Findings support hypothesis?
- C. Explain what results mean, interpret findings.
- D. Final summary of project.
- E. Suggestions for improving project.
- F. Main conclusion.

Glossary

Any scientific terms that may be unfamiliar to the average reader must be defined in a glossary. The glossary will be part of your scientific paper. Use the following guidelines.

1. Type the term in 12-pt. bold text.
2. Add a hyphen after the term.
3. Type the definition in 12-pt. plain text.

The word Glossary should be typed at the top of your list of words, as a title to the page. Use 16-point, bold text.

Appendix

The appendix section of your paper includes information that did not fit in your introduction, but is still important to your project. For example, perhaps your project is about the effects of various beverages on teeth. In the appendix section, you may want to include the ingredients found in a Coca-Cola can or maybe a drawing of the teeth in your mouth or even a diagram describing the process of how teeth become stained.

Overall, the appendix provides extra information that will help the reader understand your project better. You may choose to include charts, tables, documents, pamphlets, sheets, interview questions, time lines, or the process used to set up your project (ex: arrangement of plants studied.) Copies may be used, but they should be clear and easy to understand.

Directions:

Provide a title page for this section of the paper.

The word Appendix (capitalized) should be typed in 16-point bold text and centered in the middle of the page.

Place only one item on each sheet of paper.

Write a title and brief explanation describing what the reader is seeing.

1-3 sentences are enough.

Tips:

Be neat if you are cutting, color to enhance the drawings etc; don't forget to label all items, and if the item is being copied, enlarge it.

Works Cited Page

Terms to Know:

Bibliography – (n.) A list of the sources that you used to find information.

The difference between a bibliography and a Works Cited page is that the Works Cited page lists only the sources that provided quotes for your scientific paper. This page contains the publishing information of about every source that you used in creating your research paper. The following information applies to Works Cited pages for all research papers. Use this information for English class, history class, etc. Save this information for college!

Before beginning your Works Cited page, you must collect the following information about every source that you used. The information should be on your bibliography cards.

- complete title
- full name of author(s)
- city of publication
- publishing company
- year of publication
- page numbers that you used (if applicable)
- access date for internet information (if applicable)

The title of your page should be Works Cited. This should be underlined and in bold. It should not have quotation marks.

In your Works Cited page, every parentheses, period, comma, etc. is very important. Equally important is that you follow the guidelines created by the APA. Please refer to your SHS Student Agenda for examples of APA citations.

Presenting to the Judges

On average, you will have two to three judges whose job it is to find out how knowledgeable you are regarding your topic. Impress the judges with your knowledge, confidence, and speaking skills. Answer questions and ask questions. If you can't answer the question, consider three things.

1. Is the wording of the question throwing you off? If so, ask the judge to rephrase the question.
2. Do you think that the question is irrelevant (has no connection) to your project? Again, if this is the case, ask the judge to clarify or restate the question.
3. The one thing you **don't** want to do is say, "**I don't know.**"

When speaking, pay close attention to the following:

Introduce yourself. Make the judges feel welcome. Let the judges know that you appreciate their time spent with you. At the end of your presentation, say, "Thank you."

Have good eye contact.

-Look directly at the judges, **not** at your research paper or backboard.

Keep hands out of pockets, away from hair or jewelry.

Maintain good posture (stand straight and don't fidget).

-Proper posture signals confidence.

Speak loudly and clearly.

-Refrain from mumbling, speaking too fast, etc...

Show your knowledge.

-If a judge does not ask about an important aspect of the project, mention it yourself.

If the need arises, refer to your paper or backboard to answer a question.

-Otherwise, **do not depend** on them to answer questions. This will show the judges that you know your material.

Have a serious tone while speaking or asking questions. **(Be professional!)**

-Don't laugh or look at others while speaking with the judges.

Refrain from saying, "uhms, uhs, likes", etc...

Most importantly, practice, practice, and practice.

-Know what you're going to say well in advance. It's a good idea to have different people ask you sample questions regarding your project.