

September 15, 2015

Dear Parents and Students,

For the next few months, we will be working on our science fair projects. The first step is writing the research paper. We will be working on the research paper from now until the beginning of December. We will then begin the experimental process and finally conclude the final project in January.

Students have been given two packets. This is an informational packet and the other is a worksheet packet. Please read through both of them. We will be discussing and working through the packets in class although some work at home will also be required.

The second page of this packet has "Science Fair At-A-Glance." This explains the highlights of the entire process. The following page is a timeline for the entire project. Please be aware of due dates. Also included in the packet are detailed guidelines, example worksheets, checklists, and also grading rubrics.

If you have any questions, please contact Ms. Davis at edavis@pbastaff.org.

Sincerely,

Ms. Davis

Please sign and return.

I have read both science fair packets.

Parent signature

Student signature

Science Fair At-A-Glance

Students in the 7th-10th grades will complete a science fair project.

The research paper portion will be the following lengths:

Middle School- 750-1000 words

High School- 1250-1500 words

Students will be given a list of assignments and due dates at the beginning of the process.

Grading for all assignments except the final research paper and final project will be pass/fail completion quiz grades. Although these assignments are only for completion, students need to do their best with each assignment. I understand that students are learning through this process and I strive to help them to improve research skills. In order for me to give worthwhile feedback, I need each student to give his or her best effort. I will be checking assignments not only for completion but also to give feedback for improvement which does not affect the grade. (Example- Teacher will give 100% for completing the assignment and will mark grammar errors that need to be fixed.)

The final research paper and final project will graded according to rubrics. The research paper is one test grade and the final project is two test grades.

During the research portion of the project, students will be given at least one class period a week to work on assignments that are due. This will allow students to receive help with this process.

Attached is a list of topics that should be avoided. Students are encouraged to be creative and choose a topic they are interested in. **Please do not find an experiment online and copy it.**

Students will be receiving two packets. One packet is informational; it has guidelines, examples, and checklists. I will discuss this information throughout the project process. The second packet is filled with worksheets. These worksheets will help students organize their information. I will explain how to use the worksheets using examples from the informational packet.

On science fair day, students will stay with their projects and speak to judges and visitors who peruse the fair. Parents are invited to join us that day.

I understand that "real" scientists may not do every step of this process or in this exact format. The purpose of a science fair project is not to be "real" scientists, but to gain skills that can apply to many areas in life while also becoming familiar with the scientific method. The goal is to teach students the skills of researching, communicating (both written and oral), long-term planning, and critical thinking.

Science Fair Due Dates 2015-2016

September-

- 15- Intro and research in library
- 22- Research in library- **Bring logbook from now on**
- 29- General topic and research question due

October-

- 6- Research plan due
- 13- Preliminary outline and resources due
- 26- Research notes due
- 27- Intro paragraph due
- 28- IA/ IB paragraphs due

November-

- 3- IIA/IIB paragraphs due
- 9- IIIA/IIIB paragraphs and conclusion paragraph due
- 17- Rough draft due

December-

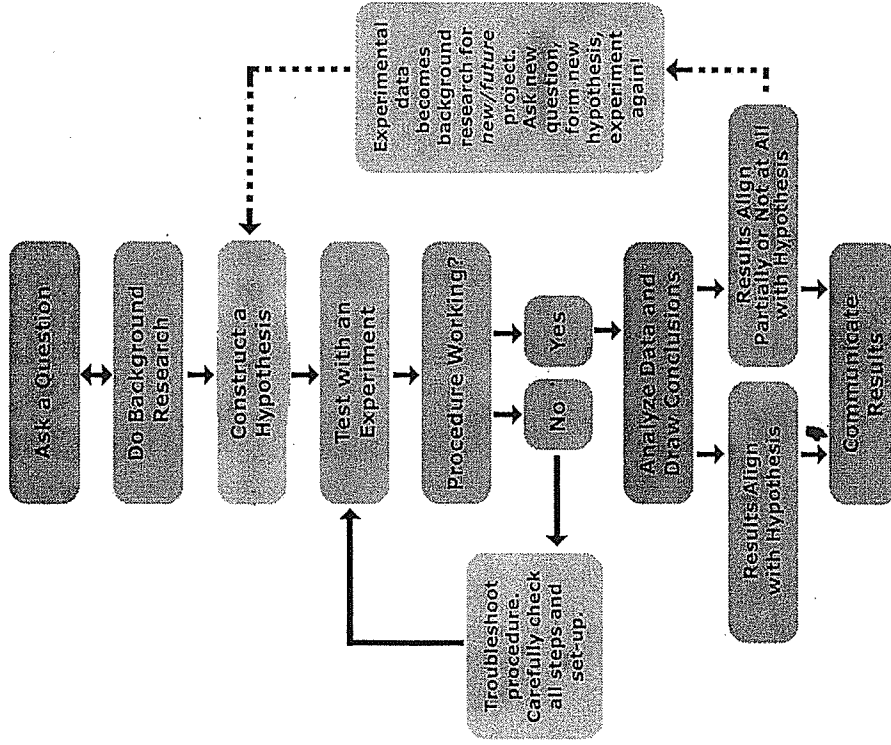
- 1- Abstract due
- 8- Final research paper due
- 15- Hypothesis and experiment plan due
- 15- January 8- Test hypothesis with experiment

January-

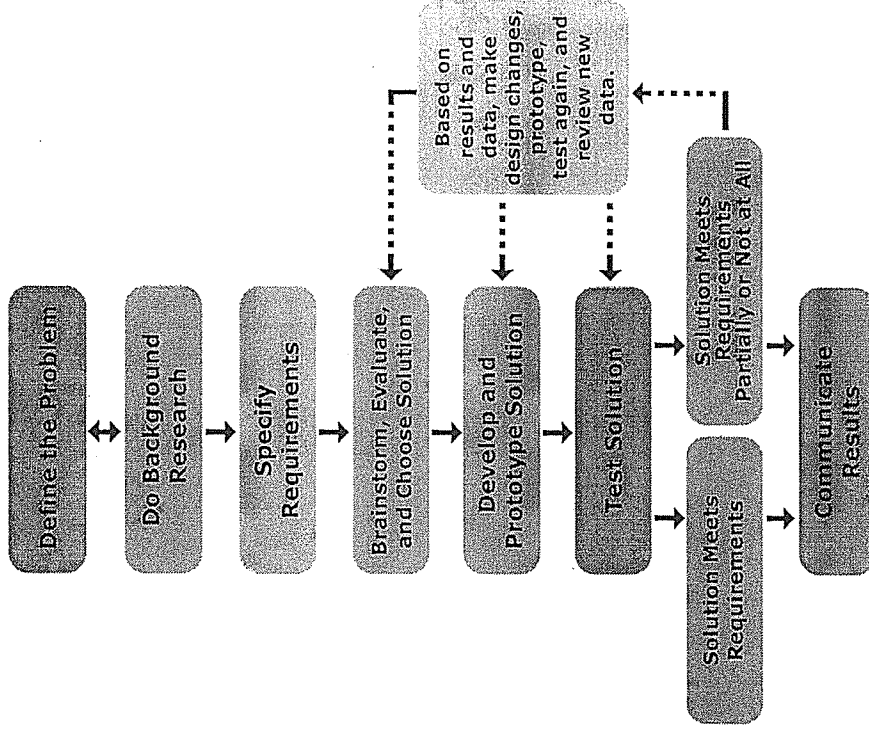
- 12- Graph and table due
- 21- Project conclusion
- 26- Binder due
- 29- Science fair- Parents are invited to attend

Comparing the Scientific Method and the Engineering Design Process

Scientific Method



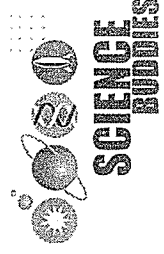
Engineering Design Process



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Topic to Avoid	Why
Any topic that boils down to a simple preference or taste comparison. For example, "Which tastes better: Coke or Pepsi?"	Such experiments don't involve the kinds of numerical measurements we want in a science fair project. They are more of a survey than an experiment.
Most consumer product testing of the "Which is best?" type. This includes comparisons of popcorn, bubblegum, make-up, detergents, cleaning products, and paper towels.	These projects only have scientific validity if the Investigator fully understands the science behind why the product works and applies that understanding to the experiment. While many consumer products are easy to use, the science behind them is often at the level of a graduate student in college.
Any topic that requires people to recall things they did in the past.	The data tends to be unreliable.
Effect of colored light on plants	Several people do this project at almost every science fair. You can be more creative!
Effect of music or talking on plants	Difficult to measure.
Effect of running, music, video games, or almost anything on blood pressure	The result is either obvious (the heart beats faster when you run) or difficult to measure with proper controls (the effect of music).
Effect of color on memory, emotion, mood, taste, strength, etc.	Highly subjective and difficult to measure.
Any topic that requires measurements that will be extremely difficult to make or repeat, given your equipment.	Without measurement, you can't do science.
Any topic that requires dangerous, hard to find, expensive, or illegal materials.	We care about your safety and your parents' pocketbook.
Graphology or handwriting analysis	Questionable scientific validity.
Astrology or ESP	No scientific validity.
Any project in violation of state law, federal law, state science fair rules, or International Science & Engineering Fair rules.	In brief, you may not do a project that involves: <ul style="list-style-type: none"> • Unacceptable risk (physical or psychological) to a human subject • Collection of tissue samples from living humans or vertebrate animals • Drugging, pain, or injury to a live vertebrate animal • Use of illegal or prohibited materials

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2007/11/07

I. Getting started

Probably one of the most difficult steps in the project is the choice of a topic. The following areas of competition are:

Category 1: Biological Sciences

- Medicine & Health
- Genetics & Cytology
- Microbiology & Biotechnology
- Botany
- Zoology
- Marine Biology

Category 2: Physical Sciences

- Forces and Motion
- Astronomy
- Chemistry
- Alternative Sources of Energy
- Robotics
- Technology
- National Security & Safety
- Geology
- Oceanography
- Meteorology
- Environment

A. Choose a topic of personal interest.

B. Choose a problem within that topic that has enough material to conduct research.

C. Choose a problem within that topic that can be investigated within your time frame and financial constraints.

D. Decide if you will use the Scientific Method to investigate and collect data, or the Engineering Design Process (8th grade and up only) to solve the problem and build a prototype.

There are six steps to the scientific method:

1. Ask a Question: The scientific method starts when you ask a question about something that you observe: Who, What, Where, When or How? This is called the Problem. A good Problem/Question must be observable, measureable, and repeatable.

2. Do Background Research: Use the library and internet to research information we already know about your topic. Also, you can interview professionals that will give you helpful information. You are educating yourself to make a solid hypothesis to test.

3. Construct a hypothesis: A hypothesis is a proposed explanation made on the basis of your background research. The hypothesis is formatted using an "if-then" statement.

"If _____ [I do this] _____, then _____ [this] _____ will happen."

"If _____ [this is true, like a scientific law] _____, then _____ [this] _____ will happen."

4. Test the Hypothesis by Doing an Experiment: An experiment tests whether the hypothesis can be proven to be true or false. You will make a list of materials needed, and identify steps to be taken in your procedure. You must identify one factor or variable that is changed, while keeping all other conditions the same. The group that experiences the changed factor is called the 'Experimental Variable Group', and the group that does not experience the factor is the 'Control Group'. The data of these two groups will be compared. Experiments should be repeated 3-5 times to confirm the results are accurate, and not a chance occurrence. You will then average the data of repeated experiments.

5. Analyze the Data and Graph the Results: The averaged data must be presented in a bar graph, line graph, or pie chart for comparison. A summary should be written of the results as compared in the graphs.

6. Draw a Conclusion: There are two options for the conclusion – based on the results, one can either reject or accept the hypothesis. You must answer the original problem/question. You must apply the information learned from the investigation, and how the project could be improved or continued.

There are 7 steps to the engineering design process:

1. Identify the Problem: State the challenge problem in the form of a question.

Example: How can I design a _____ that will _____?

2. Identify Criteria and Constraints: Specify design requirements, or criteria.

3. Brainstorm Possible Solutions: Sketch your ideas to solve the problem. These sketches should be brief and use rudimentary labels to show the basic mechanics of the item.

4. Explore Possibilities: Discuss the ideas with teachers and field professionals. Determine the pros and cons of each design idea.

5. Select an Approach: Identify a design that best appears to solve the problem and create a statement that describes why this solution was chosen. Include criteria and constraints.

6. Build a Model or Prototype: List materials and isometric drawings. Construct a full-size or scale model based on the drawings.

7. Refine the Design: Examine and evaluate the prototype based on the criteria and constraints listed previously. Identify any problems and pose additional solutions.

II. Four major parts of the science fair project (value of each score)

A. Research Paper

Research is conducted first in order to educate the student in the topic he/she has chosen for an experiment. All resource information must be recorded in the journal.

The information gathered will be presented in a research paper. Middle School students will write a 4-6 page paper, while high school students will write a 6-8 page paper.

The research paper will count for 20% of the total score.

B. The Journal

This includes your Bibliography/Resource List, Title, Problem/Question, Purpose, Research Statement, Hypothesis (or Criteria & Constraints & Approach in Engineer Design), Materials list, and Procedure steps (or Drawings in Engineer Design). This is called The Investigative Plan and is recorded in a journal or log book.

The journal will count for 20% of the total score.

C. The Experiment or Prototype

This is probably the most important part of the project. The data collected and the graphed results, or an evaluation of a prototype in the case of engineering design, are to be recorded in the journal/log book. Your final conclusion is also written in the journal.

The experiment or prototype will count for 40% of the total score.

D. The Display

The final aspect of the project is the display. This includes a 3-sided science fair display board (32"-36" tall). The display visibly communicates the process followed and the findings achieved.

The display will count for 20% of the total score.

III. The Research Paper

The research paper presents the information the student has gathered, demonstrating the student's knowledge in the area to be investigated. The paper must be typed, double-spaced, 12 font (times new roman) using APA format.

- There must be a title page or cover page that includes the Title of the project in a large font, a picture or clip art reflecting the project's topic, and the student's information in a smaller font. (student name, school name, city, grade, area of competition) – all centered on the page.
- Next, there must be an outline showing the main points discussed in the body of the paper.
- There must be an abstract that briefly describes the paper. It should precede the main body and is to be on a separate sheet of paper. It needs to be between 100 and 150 words.
- The paper must begin with an introduction paragraph that has a thesis sentence and main points addressed in the paper.
- There must be a body of 6 or more paragraphs. Each paragraph must have a topic sentence.
- The paper ends with a conclusion paragraph of the research information which should flow into the problem to be investigated. The conclusion should end with the question.
- The paper must be 4-6 pages for middle school and 6-8 pages for high school.
- The last page of the paper should have a Resources cited list.

Middle school must have a minimum of 4 sources, and high school must have a minimum of 6 sources.

IV. The Journal or Log Book

- The journal is a composition notebook which contains all relative information collected from the beginning to end of the project.
- The journal should be recorded in **pen** and written legibly. If a mistake or change in data or information is required, then simply strike through with a single line and then record the correct information. If necessary, make a note in the margin of the reason for the strike through.

- The journal should be a thorough record of the student's thoughts, adjustments, sketches, findings, and conclusions.
- It should be divided into three major portions: 1. Research (bibliography, research rough draft and notes), 2. Investigative Plan (title, question, purpose, research statement, hypothesis or criteria/approach, materials, and procedure or drawings), and 3. Experiment (data, result graphs, and conclusion).

V. The experiment or prototype

- The experiment is an investigation to test the hypothesis.
- It involves a control, or standard, to which the factor (variable), or changed condition, can be measured against.
- The experiment requires a large population tested, or a series of repetition in order to verify the results. Several simultaneous experiments using the same controls are acceptable.
- The data (measurements, observations) must be recorded on a data table in the journal.

Indicate units of measurement, take pictures to show sequence or changes, and average repeated tests. Date your work!

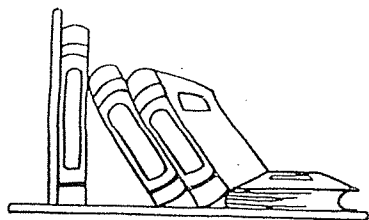
- Identify the control group, and the experimental group (with the factor/variable) in the experiment.
- The experiment should reflect careful attention to detail and demonstrate scientific thinking.
- A prototype is a model used to solve a problem in an Engineering Design Project.

VI. The display

- One display per student will be permitted. The work must be that of the student with limited assistance from teachers, parents, or professionals.
- A student may not submit an identical repetition of a previous year's project. However, a student may exhibit a project based on previous work, provided progress is demonstrated. The previous research paper and log book must be a part of the current display in order to show progression and further investigation.
- The display will include a 3-sided board that is no taller than 46", no wider than 48", and a maximum depth of 30".

o All information must be typed or printed in a professional appearance and must include the following:

- o Title (can be a title board)
 - o Subtitles
 - o Problem/Question
 - o Purpose
 - o Hypothesis (If...then statement)
 - o Abstract
 - o Materials (bulleted list)
 - o Procedure (numbered steps)
 - o Data (table, charts, pictures)
 - o Results (analyzed data in graphs)
 - o Conclusion (compare data and results to the hypothesis, answer the question, apply the information with benefit or profit, suggest further study, etc)
 - o All information presented on board must also be placed into the binder with the research paper will be displayed on the table.
 - o The journal/log book will be displayed on the table with the binder.
-
- A display of the actual experiment or a prototype (engineering design) can be presented with the 3-sided board. If it is larger than the above dimensions, then the student must complete a Request to Submit form, indicating the purpose and dimensions of the display.
 - Experiments involving any living animal or biological cultures must be completely contained.
 - No firearms, explosives, or flammable substances of any kind will be displayed.



Selecting Quotations

What should I quote?
Choose something that:

- Elicits a feeling (anger, determination, excitement, frustration).
 - Surprises you.
 - You consider worth sharing.
- You disagree with or you agree with.
 - You feel is wrong information.
 - Is said in an unusual, catchy way.
- Is important for other people to know.
- You would like to talk or write about.
- Reminds you of a similar situation.

Selecting a quotation does not mean finding a sentence with quotation marks. It means finding a full sentence or part of a sentence—with or without quotation marks—that you copy word for word and attribute to the original writer.

Example

DATE _____ CLASS HOUR _____

Topic Question: Is more strain put on the knee in grand plies than in demi plies?

Thesis: _____

The structure of the knee allows varying degrees of stress to easily cause injuries.

My Working Outline

- I. Knee Structure
 - A. Bones and ligaments
 - B. Muscles and tendons
- II. Knee stress
 - A. Internal stressors
 - B. External stressors
- III. Knee injuries
 - A. Common injuries
 - B. Injury treatments

Example

BODY PLAN
ROMAN NUMERAL I A

OUTLINE POINTS:

I. Knee structure

A. Bones and ligaments

TRANSITIONAL TOPIC SENTENCE: (must include words in outline point I and A)

To begin an investigation of the movement of the human knee, it is important to understand how the bones and ligaments work together.

MAIN IDEA	CARD NUMBERS	CARD INFORMATION with CITATION
1. Bones involved	1, 2	Types of joints - (healthpages.org) menisci - (healthpages.org)
2. Ligaments attached	7, 10, 3, 5	names of ligaments - (healthpages.org) def. of ligament - (dictionary.com)
3. movement	4, 8	modified hinge - (healthpages.org) limitation of ligaments - (healthpages.org)

CHECK THE FOLLOWING

1. Do you have at least one card for each main idea?
2. Does the information on each card support/explain both the outline point and the main idea you have listed in the box.

Example

TEMPLATE FOR ROMAN NUMERAL I A

TRANSITIONAL TOPIC

SENTENCE: To begin an investigation of the movement of the human knee, it is important to understand how the bones and ligaments work together.

SENTENCE WITH WORDS FROM BOX 1

1. You must include a transition word.
2. Using the WORDS IN BOX 1, combine them with you own words to from a complete sentence.

First the four bones which comprise the knee are the femur, patella, tibia, and fibula!

SENTENCE/SENTENCES WITH MATERIAL FROM CARD

1. You may need to add some of your own words to make this sentence flow with the one before it.
2. You must include you intext citation in proper format at the end of the sentence.

"There are two joints in the knee — the tibiofemoral joint, which joins the tibia to the femur, and the patellofemoral joint which joins the kneecap to the femur." (healthpages.org) Between these joints, cartilage helps to absorb shock and reduce friction.
"Attached to the top of the tibia on each side of the tibial plateau are two crescent-shaped shock absorbing cartilages called menisci which help stabilize the knee." (healthpages.org)

YOU MUST HAVE YOUR TEACHER CHECK THIS PAGE BEFORE YOU CONTINUE TO THE NEXT PAGE.

Example

SENTENCE WITH WORDS FROM BOX 2

1. You must include a transition word.
2. Using the WORDS IN BOX 2, combine them with you own words to from a complete sentence.

Likewise, a system of five ligaments holds the bones of the knee in place.

SENTENCE/SENTENCES WITH MATERIAL FROM CARD

1. You may need to add some of your own words to make this sentence flow with the one before it.
2. You must include you intext citation in proper format at the end of the sentence.

A ligament is "a band of tissue, usually white and fibrous, serving to connect bones." (dictionary.com) The two collateral ligaments, the medial collateral ligament and lateral collateral ligament, attach to the sides of the tibia and femur. The anterior cruciate ligament and the posterior cruciate ligament cross each other in the center of the knee. (healthpages.org)
"The patellar ligament attaches the kneecap to the tibia." (healthpages.org)

SENTENCE WITH WORDS FROM BOX 3

1. You must include a transition word.
2. Using the WORDS IN BOX 3, combine them with you own words to from a complete sentence.

The bones and ligaments work together to allow proper movement in the knee.

SENTENCE/SENTENCES WITH MATERIAL FROM CARD

1. You may need to add some of your own words to make this sentence flow with the one before it.
2. You must include you intext citation in proper format at the end of the sentence.

The afore mentioned joints of the knee work together to not only allow bending and straightening but slight rotating and moving from side to side. (healthpages.org) The ligaments help to keep the bones aligned during movement and help to limit the motion of the bones. "The pair of collateral ligaments keep the knee from moving too far side to side." (healthpages.org) The cruciate ligaments allow the swinging motion of the tibia without it sliding out of the tibiofemoral joint.

Example 91A

To begin an investigation of the movement of the human knee, it is important to understand how the bones and ligaments work together. First, the four bones which comprise the knee are the femur, patella, tibia, and fibula. "There are two joints in the knee- the tibiofemoral joint which joins the kneecap to the femur (healthpages.org)." Between these joints, cartilage helps to absorb shock and reduce friction. "Attached to the top of the tibia on each side of the tibial plateau are two crescent-shaped shock absorbing cartilages called menisci which help stabilize the knee (healthpages.org)." Likewise, a system of five ligaments holds the bones of the knee in place. A ligament is "a band of tissues, usually white and fibrous, serving to connect bones (dictionary.com)." The two collateral ligaments, the medial collateral ligament and lateral collateral ligament, attach to the outsides of the tibia and femur. The anterior cruciate ligament and the posterior cruciate ligament cross each other in the center of the knee (healthpages.org). "[The] patellar ligament attaches the kneecap to the tibia (healthpages.org)." The bones and ligaments work together to allow proper movement in the knee. The afore mentioned joints of the knee work together to not only allow bending and straightening but slight rotating and moving from side to side (healthpages.org). The ligaments help to keep the bones aligned during movement and help to limit the motion of the bones. "The pair of collateral ligaments keep the knee from moving too far side-to-side (healthpages.org)." The cruciate ligaments allow the swinging motion of the tibia without it sliding out of the tibiofemoral joint. (healthpages.org)

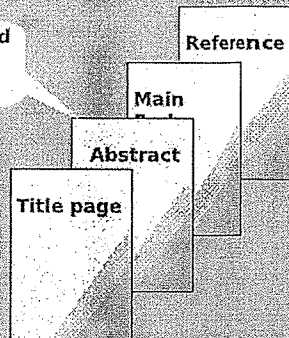
What is APA?

APA is the documentation style developed by the *American Psychological Association* and used in the social sciences divisions of many colleges and universities.

- There are many different styles used to document sources in written work.
- Each style has its own rules and uses.

General Format

Your essay should include four major sections:



General Format

Your essay should:

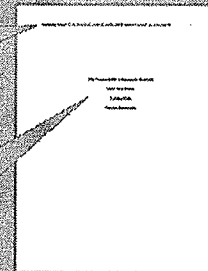
- be typed and double-spaced, be printed on standard-sized paper (8.5" x 11")
- use 1" margins on all sides
- use 10-12 pt. Times New Roman or a similar font
- include a page header (title) in the upper left-hand of every page and a page number in the upper right-hand side of every page

Note: If you are writing a manuscript draft, APA suggests using two spaces between sentences to aid readability (see pp. 87-88 in the APA manual).

Title Page

Page header:
(use Insert Page Header)
title flush left + page number flush right.

Title:
(in the upper half of the page, centered)
name (no title or degree) + affiliation (university, etc.)

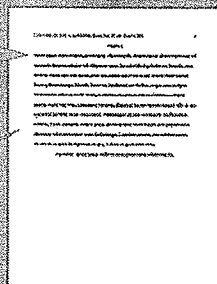


Abstract Page

Page header: do NOT include "Running head:"

Abstract: centered, at the top of the page

Write a 150- to 250- word summary of your paper in an accurate, concise, and



Main Body (Text)

- Number the first text page as page number 3
- Type and center the title of the paper centered, at the top of the page
- Type the text double-spaced with all sections following each other without a break
- Identify the sources you use in the paper in parenthetical in-text citations
- Format tables and figures

Why do we document sources?

- Clear communication
- So our readers know where our information comes from and how to retrieve it.
- To lend credibility to our work.
- ****To avoid plagiarism.****



What is Plagiarism?

Plagiarism is representing someone else's work (including their words and ideas) as one's own or providing materials for such a representation, (for example, submitting a paper or other work that is in whole or part the work of another, failing to cite references, presenting material verbatim or paraphrased that is not acknowledged and cited). (Aurora University, 2006 p. 28)

How do I avoid Plagiarism?

Properly
Document
All Sources
Used!



Two ways to document sources using APA

➔ Parenthetical Citations

(within the paper)

➔ Reference List

(at the end of the paper)

(Both are included in all papers)



When do I use parenthetical citations?

Parenthetical citations are used in the text of the work:

- When you directly quote from another's work
- When you summarize
- When you paraphrase



Direct Quote

When an author phrases an idea or concept exceptionally well you can directly quote those words by placing quotation marks around the phrase you are borrowing.

** Use sparingly **

Some instructors feel that using too many quotes shows you do not understand the information well enough to summarize or paraphrase it into your own words.



Formatting Direct Quotes




- » When quoting fewer than 40 words, the quote remains part of the text and is enclosed in quotation marks.
 - » ex. "quote"
- » The citation information for that quote will follow directly after the quote, and will be inside the quote's punctuation but outside the quotation marks
 - » ex. "quote" (citation information).
- » When quoting 40 words or more, the quote is separated into a block formation by indenting the left margin of the quoted text by .5 (1/2 inch).
 - » *Block quotes are not enclosed in quotation marks.*
- » The citation information for a block quote will directly follow the quote but will NOT be included in the punctuation of that quote.

Example of a Block Quote

(direct quote of 40 or more words)

Field (2000) discusses how, without even knowing we are doing it, we learn the facts, skills, ideas and emotional capacity simply by being enrolled in that permanent institution, The University of Life. We learn from dialog with friends, families and strangers; we learn by trying new things out; we learn by watching television and reading books; we learn by browsing through record collections and surfing the Internet; by remembering, thinking, and reflecting. (p. 12)

When *directly quoting* or drawing attention to a *specific part* of a source, use three elements in your citation:

- ✓ Author's Name 
- ✓ Year of publication 
- ✓ Page or paragraph number of information quoted 

Example:

(Booth, Colomb & Williams, 2003, p. 203)
(Doyle, n.d., para. 3)

Summarize

To merge together ideas or concepts from one or multiple authors using your own words and sentence structure.



Paraphrase

To describe your understanding of an author's idea in your own words.



An example of plagiarism when paraphrasing

Original

It is tricky to define plagiarism when you summarize or paraphrase. They are not the same, but they blend so seamlessly that you may not be aware when you drift from summarizing into paraphrasing, then across the line into plagiarism. No matter your intention, a close paraphrase may count as plagiarism, even when you cite the source. (Booth, Colomb, & Williams, 2003 p. 203)

Plagiarism:

It is difficult to define plagiarism when summarizing and paraphrasing are involved, because while they differ, their boundaries blur, and a writer may not know when she is summarizing, paraphrasing or plagiarizing. Regardless, too close a paraphrase is plagiarism, even when the source is cited.

This example is plagiarism because the sentence structure and most of the phrasing is the same as the original source. To properly paraphrase, you must put the information into your own words and create your own sentence structure.

Example of an acceptable paraphrase

Original

It is tricky to define plagiarism when you summarize or paraphrase. They are not the same, but they blend so seamlessly that you may not be aware when you drift from summarizing into paraphrasing, then across the line into plagiarism. No matter your intention, a close paraphrase may count as plagiarism, even when you cite the source. (Booth, Colomb, & Williams, 2003 p. 203)

An acceptable paraphrase:

According to Booth, Colomb, and Williams (2003), writers sometimes plagiarize unconsciously because they think they are summarizing when, in fact, they are too closely paraphrasing. Even when this is done unintentionally, and when sources are properly cited, it is still plagiarism.

This paraphrase is acceptable because the sentence structure and phrasing have clearly been reformatted from the original.

Tips for avoiding plagiarism

- When taking notes from a work that you intend to include in your paper, do not look at the original work while you write down your thoughts. Read the information, then write down your understanding of it without looking at the source. This practice helps you put the ideas in your own words right from the start.
- When you are ready to include the information from this source in your paper, use your notes, not the original; then rewrite/rephrase the information a second time, matching it to the text you are including it in.
- While you should double check the original to assure that you have correctly understood the idea, the easiest way to 'accidentally' plagiarize is to try writing while reading from the original.

When summarizing or paraphrasing, use two elements in your citation:

¾ Author's last name



¾ Year of Publication



Example:

(Booth, Colomb & Williams, 2003) or
(Doyle, n.d.)

There are three options for placing parenthetical citations, depending on your focus:

If you are focusing on the author's idea, place the citation at the end of that idea.

This analogy was used to illustrate the consequences of formal learning that does not take informal learning into context (Smith, 1998).

If you are focusing on a particular researcher(s), use their surname(s) in your text.

Smith (1998) uses this analogy to illustrate the consequences of formal learning that does not take informal learning into context.

If you are focusing on time, place the date in your text.

In 1998, Smith used this analogy to illustrate the consequences of formal learning that does not take informal learning into context.

Variations on Citations

- Citations with two or more authors
(Black & White, 2001)
always cite both authors
- Citations with three, four, or five authors
(Black, White, & Red, 2001)
Subsequent citations only use first author and et al.
(Black et al., 2001)
- Citations with 6 or more authors
use et al. for all citations
(Black et al., 2001)

Variations on Citations

- Group author with acronym
(National Institute of Mental Health [NIMH], 1999)
▪ Subsequent citations
(NIMH, 1999)
- Citation with no author.
Use part or all of the title, including the first major word.
For a work titled: *Winning the War Against Poverty*
If it is an article ("Winning," 2001) or ("Winning the War," 2001)
If it is a book, web site or major report
(*Winning the War*, 2001)

Variations on Citations

- Citation with no date
For online materials use posted on or last updated date.
(Black, n.d.)
- Citation with no clear page number
(Black, 2001, chap. 2)
(Black, 2001, para. 4)
(Black, 2001, Method section, para. 2)

Variations on Citations

- Multiple citations for a sentence
Place names in alphabetical order and separate them with a semicolon
(Black, 2001; Pink & Blue, 2002; Purple, 1992)
- More than one source with the same author and year
(Black, 2001a; Black, 2001b)
- Personal communication (email, phone conversation, personal interview, etc.)
(M. Doe, personal communication, June 20, 2004)

Variations on Citations

- If you cite the same source twice in a paragraph, you need not include the year in the second reference, as long as it will not be confused with other sources in the paper.

In a recent study of reaction times, Walker (2000) described the method...Walker also found...

What is the reference list?

The reference list provides the information your reader will need to retrieve the sources you used.

The reference list should include ALL of the citations you used in your text.

**The reference list is not a bibliography. It does not include works you did not refer to in your text. **



How do I create the reference list?

- The reference list should begin on a separate page from the text of the document, but should be part of the document's page numbers (do not make it a separate document).
- Center the word References at the top of the page.
- Begin the first reference on the first line under the word References (do not leave a space).
- Set the format to Double Space, but do not include additional spaces between entries.
- Each source will have an individual entry
- List your sources in alphabetical order according to the authors' last name (or title if last name is not available).
- Create a hanging indent to allow the author's name to be easily found.

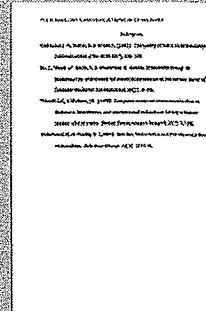
References Page

• Center the title (References) at the top of the page. Do not bold it.

• Double-space reference entries

• Flush left the first line of the entry and indent subsequent lines

• Order entries alphabetically by the



Example of a Reference List

APA Paper 10

References

- Kocher, P. H. (1972). *Master of Middle-earth: The fiction of J. R. R. Tolkien*. Boston: Houghton Mifflin.
- Napoli, P. M. (1999). The marketplace of ideas metaphor in communications regulation. *Journal of Communication*, 49(4), 151-169.
- VanDenBos, G., Knapp, S., & Doe, J. (2001). Role of reference elements in the selection of resources by psychology undergraduates [Electronic version]. *Journal of Bibliographic Research*, 5, 117-123.

Reference list entry information

- Author.
- (Date of publication).
- Title.
- Publication Information (for books)
 - Location (City, State)
 - Publisher Name
- Source (for journals, magazines ect.)
 - Title of publication
 - Volume, issue & page numbers
- Retrieval information (for web sites and databases)
 - Date retrieved (month day, year)
 - URL or database name



Journal Article

- Napoli, P. M. (1999). The marketplace of ideas metaphor in communications regulation. *Journal of Communication*, 49(4), 151-169.



- ☐ Article in a Monthly or Bimonthly Magazine
Nilsson, G. E. (1999, October/November). The cost of a brain. *Natural History*, 108, 66-72.
- ☐ Article in a Weekly or Biweekly Magazine
Lacayo, R. (2000, January 31). Health care: A litmus test. *Time*, 155, 38-40.

- ☐ Newspaper Article, Author Indicated

Goozner, M. (2000, January 29). Economy races toward rate hike. *Chicago Tribune*, pp. 1, 14.

- ☐ Newspaper Article, Author Not Indicated

Russia plans to increase its arms budget by 50%. (2000, January 28). *Wall Street Journal*, p. A16.

Government Document

National Institute of Mental Health. (1969). *Volunteer services in mental health* (Publication No. 1002). Chevy Chase, MD: National Clearing House for Mental Health Information.



Recording, Film or Broadcast

The Canadian Brass. (1995). *I found love*. On *Swingtime* [CD]. New York: BMG Music.

Kurtz, G. (Producer), & Lucas, G. (Director). (1977). *Star Wars* [Motion picture]. United States: 20th Century Fox.

York, J. (Producer). (1991, July 26). *CNN crossfire* [Television broadcast]. New York: Cable News Network.

Book – Single Author

Kocher, P. H. (1972). *Master of Middle-earth: The fiction of J. R. R. Tolkien*. Boston: Houghton Mifflin.



Multiple Books – by the Same Author

Place entries in chronological order

Morson, G. S. (1988). *Boundaries of genre*. Evanston, IL: Northwestern University Press.

Morson, G. S. (1994). *Narrative and freedom: The shadows of time*. New Haven, CT: Yale University Press.

Book – Multiple Authors

6 or fewer - include all authors
Schlossberg, N. K., Lynch, A. Q., & Chickering, A. W. (1989). *Improving higher education environments for adults*. San Francisco: Jossey-Bass.

6 or more use first 6 authors, then et al.

Book – Edited

Klemke, E. D. (Ed.). (1970). *Essays on Bertrand Russell*. Urbana, IL: University of Illinois Press.

Book – Multiple editors

Brady, F., Palmer, J., & Price, M. (Eds.). (1973). *Literary theory and structure*. New Haven, CT: Yale University Press.

Article or Chapter in an Edited Book

Frank, J. (1974). The world of Raskolnikov. In R. L. Jackson (Ed.), *Twentieth century interpretations of Crime and Punishment* (pp. 81-90). Englewood Cliffs, NJ: Prentice-Hall.

Work in an anthology

Lipstadt, D. E. (2004). The Holocaust. In H. Bloom (Ed.), *Literature of the Holocaust* (pp.109-127). Broomall, PA: Chelsea House. (Reprinted from *The Shocks guide to Jewish books: Where to start reading about Jewish history, literature, culture, and religion*, pp.129-148, by B. W. Holtz, Ed., 1992, New York: Shocks Books)

[Note: In text, use the following parenthetical citation: (Lipstadt, 1992/2004)]

Preface, Introduction, Foreword, or Afterword

Oswald, M. (1962). Introduction. In Aristotle (Oswald, Trans.), *Nicomachean ethics* (pp. xi-xxiv). New York: Macmillan.

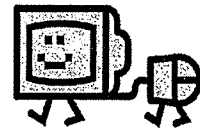
Electronic Sources

1. Author
2. Date published, last update
3. Document title or descriptive title
4. Date retrieved
5. URL (e.g., <http://www.aurora.edu>) or database



Stand Alone Internet Document

Doyle, D. (n.d.). *Reading better and faster*. Retrieved January 19, 2007, from <http://english.glendale.cc.ca.us/speed1.html>



Journal Article Retrieved from a Database

Ackerman, M. J. (2006). Forensic report writing. *Journal of Clinical Psychology*, 62(1), 59-72. Retrieved January 19, 2007, from Academic Search Premier database.

Periodical Article Online

- ❖ If same format and page numbers as print version
Fink, L. (2006). When community comes home to roost: The Southern mill town as lost cause. *Journal of Social History*, 40(1), 119-146. Retrieved February 9, 2007, from <http://www.historycooperative.org/journals/jsh/40.1/fink.html>
- ❖ If Internet-only journal or if differs from the print version
Fink, L. (2006). When community comes home to roost: The Southern mill town as lost cause [Electronic version]. *Journal of Social History*, 40(1), 119-146.

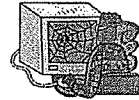
Internet Dictionary or Encyclopedia

■ No author indicated
Interest. (2006). In *Merriam-Webster online dictionary*. Retrieved January 26, 2007, from <http://www.m-w.com/dictionary/interest>



Document from a large, complex web site

Chou, L., McClintock, R., & Nix, D. H. (1993). *Technology and education*. Retrieved August 24, 2000, from Columbia University, Institute for Learning Technologies Web site: <http://www.ilt.columbia.edu/publications>



REMEMBER!

The purpose of using a particular referencing style is not to make your life more difficult. The purpose is to be absolutely clear about where you obtained your information.

One rule of thumb: whenever you refer to information that is not your own opinion or common knowledge anyone from the same area would know, CITE the SOURCE of the information. Then include that source on your reference page.



- A reference for the format is www.apastyle.com or <http://owl.english.purdue.edu/owl/section/2/10/>

Citing Online Sources

When citing an online source, use the following list, which adheres to the Modern Language Association style, and include all available and pertinent information listed for your citation in this order:

1. Name of the author, editor, compiler, or translator of the source with the last name first and followed by an abbreviation, such as ed., if appropriate
2. Title of a poem, short story, article, or similar short work within a scholarly project, database, or periodical (in quotation marks); or title of a posting to a discussion list or forum (taken from the subject line and enclosed in quotation marks), followed by the phrase Online posting
3. Title of a book (underlined or italicized)
4. Name of the editor, compiler, or translator of the text (if relevant and if not cited earlier), preceded by the appropriate abbreviation, such as Ed.
5. Publication information for any print version of the source, including publisher, location, and date of publication, if available
6. Title of the scholarly project, database, periodical, or professional or personal site (underlined or italicized); or, for a professional or personal site with no title, a description such as *Home page* (neither underlined nor in quotation marks)
7. Name of the editor or director of the scholarly project or database (if available)
8. Version number of the source (if not part of the title) or for a journal, the volume number, issue number, or other identifying number
9. Date of electronic publication, of the latest update, or of the posting
10. For a posting to a discussion list or forum, the name of the list or forum
11. The number range of paragraphs or other sections if they are numbered, or total number of pages
12. Name of any institution or organization sponsoring or associated with the Internet site
13. Date when the researcher accessed the source
14. Electronic address, or URL, of the source (in angle brackets)

Note: You won't need to include everything from these lists in a single citation; most sources don't require all the information in this list. However, if you cannot find all the information needed for a particular citation, provide as much information as is available, relevant, and current.

The following example gives you a general idea of what a basic citation, with all information available, will include. Note that each complete part of the citation is followed by a period. Punctuation within parts varies according to the following example.

Author's last name, first name. "Title of document." Title of complete work. Name of editor, translator, or compiler. Print publication information. Title of the main project or source. Name of the editor or director. Version number. Date of electronic publication or last update. Name of sponsoring organization or institution. Date of access <URL>.

Usefulness

One of the first things you must decide is whether a site is useful, especially in cases when a search engine is used. When a keyword is searched, often thousands of hits will appear. The first step in evaluation usefulness begins with the result list. By reading the title and the description of a site provided in the list, you will have a good idea if the site is worth investigating.

Once you choose a site, the true evaluation of usefulness begins. If you are investigating a broad topic, you must read through all the information on the site; then answer the following questions:

- Does the site address your topic?
- Is the information about the topic comprehensive, or is it just a superficial treatment?
- Does the site contain links to other sources that address your topic?

If the site doesn't appear to be comprehensive, don't eliminate it from your research immediately. After you have found a comprehensive site, you might be able to use bits of information from sites that only briefly address your topic. The important thing to remember is not to rely on such superficial sites for the basis of your research.

Accuracy

The most important part of evaluating a site is checking the accuracy of the source. The foremost rule in checking accuracy is "Use more than one source." The back-up source can be another Web site or a print source. Preferably a reputable company or knowledgeable person in the field will publish the original source or one of the back-up sources. If you find more than one source that conflicts with your information, it is best not to use that information. To further evaluate the accuracy of a site, answer the following questions:

- Is the text easy to understand?
- Are there grammatical and spelling errors in the text?
- Is the article biased? If so, is the bias presented as fact or opinion?
- Are the facts on the site documented? Verifiable?
- Is more than one source used for background information within the site?
- Does the site contain a bibliography?
- Are copyright laws respected?
- Is the site up-to-date?
- Are the links within the site appropriate? Up-to-date?
- Was any significant information omitted?
- Is an explanation of the research method given?

Remember that the internet allows anyone to publish, so you must be extra careful in evaluating the information you find there.

Authority

Two things to consider when evaluating the authority of a site are (1) the author of the text and (2) the publisher or sponsor of the site. The author should be

- Clearly identified
- Well-known in the field or recommended by someone who is well-known in the field
- Easily accessible, with an e-mail or postal address given

The publisher or sponsor of the page is often a good indicator of the content. If a reputable reference-work publisher, such as Encyclopedia Britannica, produces the site, it should be considered trustworthy, but the information still needs to be supported. However, if the publisher is unknown or is an individual, take extra care in checking the facts. When an organization or corporation sponsors a page, beware of bias. Often these sites are meant to persuade you either to purchase a product or to adopt a belief. Pay special attention to the language used and the way in which it is presented.

NOTE: If the name and address of the author are not readily accessible, write an e-mail to the webmaster requesting more information.

Currency

Currency is not always an issue in evaluating. For instance, if you are researching the development of state design in the 1800s, the information will stay the same whether it was printed yesterday or three years ago. However, if you are researching a current event, such as multiculturalism in today's classroom, you will need the most current information possible. As you evaluate the site, take into consideration when the information was published and when the site was last updated. Also consider the currency of the links provided on the site.

Other Bibliographic Forms

Book by a single author

Benson, Jackson J. *The True Adventure of John Steinbeck, Writer*. New York: Charles Scribner's Sons, 1991.

Book by two authors

Gillgud, John, and John Miller. *Acting Shakespears*. New York: Charles Scribner's Sons, 1991.

Book by three authors

Hirsch, E. C., Jr., Joseph F. Kett, and James Trefil. *The Dictionary of Cultural Literacy: What Every American Needs to Know*. Boston: Houghton Mifflin Company, 1998.

Book with four or more authors

Shephard, Alan, Deke Slayton, Jay Barbree, and Howard Benedict. *Moon Shot: The Inside Story of America's Race to the Moon*. Atlanta: Turner Publishing, Inc., 1994.

Book with an editor or editors

Polking, Kirk, Joan Bloss, and Colleen Cannon, eds. *Writer's Encyclopedia*. Cincinnati: Writer's Digest Books, 1983.

Book by a corporate author

Luckman Interactive. *Best of the Web*. New York: Barnes and Noble Books, 1996.

Work in an anthology

Dove, Rita. "The Oriental Ballerina." *The Norton Anthology of African-American Literature*. Eds. Henry Louis Gates, Jr., and Nellie Y. McKay. New York: W.W. Norton and Company, 1997.

Multivolume or translated work

Prost, Antoine, and Gerard Vincent, eds. *A History of Private Life*. Vol. 5 Trans. Arthur Goldhammer. Cambridge: Harvard University Press, 1991.

Edition of a book

Grauer, Robert T. and Gretchen Marx. *Essentials of the Internet*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 1997.

Government publications

United States. Dept. Of Labor. Bureau of Statistics. *Dictionary of Occupational Titles*. 6th ed. Washington: GOP, 1994.

"Steinbeck, John." *Contemporary Authors*. 1968.

Two notes about reference book bibliography entries:

1. Many reference book articles, especially those in encyclopedias, are signed, the name appearing at the end of the article. Sometimes only initials appear. In that case, the initials will correspond to authors listed either in the front matter or in the index. When articles are signed, include the author's name in the bibliography entry.
2. No page number is necessary for alphabetically arranged references like dictionaries and encyclopedias.

Government publication

United States. Dept. of Labor. Bureau of Statistics. *Dictionary of Occupational Titles*. 4th ed. Washington: GPO, 1997.

Book without stated publication information

Use the following abbreviations when publication information is not included in the book:

- n.p. no place of publication given OR
no publisher given
- n.d. no date of publication given
- n. pag. No pagination given

Insert the abbreviation in the bibliography entry at the point where full information would otherwise appear.

Magazines

Article from monthly periodical

LaRoe, Lisa Moore. "LaSalle's Last Voyage." *National Geographic* May 1997: 72-83.

Article from bimonthly periodical

Thwaites, Tim, et al. "Everything You Always Wanted to Know about Kangaroos." *International Wildlife* Sept.-Oct. 1997: 34-43.

Article from weekly or biweekly periodical

Plagens, Paterand Roy Sawhill. "Throw Out the Brushes: Commercial Artists Are Going Digital." *Newsweek* Sept. 1, 1997: 75-77.

Unsigned article

"Active Traveler Directory." *Outside* July 1997: 149-157.

NEWSPAPERS

Signed article in a daily paper

Varma, Kavita. "Footnotes in Electronic Age." *USA Today* 7 Feb. 1996, D7.

Unsigned article in quarterly paper

"Saving the Indiana Bat." *The Indiana Sierran* Winter 1997: 4.

Letter to the editor

Carlson, Gavin C. Letter. *Princeton Post Dispatch* 8 Aug. 1997: 10.

Teacher Name:

Student Name: _____

CATEGORY	15 pts total	11 pts. total	7 pts total	3 pts. total
Organization	Information is very organized with well-constructed paragraphs.	Information is organized with well-constructed paragraphs.	Information is organized, but paragraphs are not well-constructed.	The information appears to be disorganized.
Quality of Information	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
Formatting	Followed APA format with one or less errors. Included at least 3 of these: title page, outline, abstract, and resource page.	Followed APA format with a few errors. Included at least 2 of these: title page, outline, abstract, and resource page.	Followed APA format with many errors. Included at least 1 of these: title page, outline, abstract, and resource page.	Did not follow APA format. Only have none of the following: title page, outline, abstract, and resource page.
Number of Typed Pages	HS- 1250-1500 words MS- 760-1000 words	HS- 950-1249 words MS- 610-759 words	HS- 650-949 words MS- 460-609 words	HS- 350 words MS- 310 words
Rough Draft	Turned in rough draft with final draft.			No rough draft.
Mechanics- Grammar and Spelling	4 or less errors per page	5-8 errors per page	9-11 errors per page	12 or more errors per page



Hypothesis Checklist

What Makes a Good Hypothesis?	For a Good Hypothesis, You Should Answer "Yes" to Every Question
Is the hypothesis based on information contained in the Research Paper?	Yes / No
Does the hypothesis include the independent and dependent variables?	Yes / No
Have you worded the hypothesis so that it can be tested in the experiment?	Yes / No
If you are doing an engineering or programming project, have you established your design criteria?	Yes / No

Materials List Checklist

What Makes a Good Materials List?	For a Good Materials List, You Should Answer "Yes" to Every Question
Have you listed all necessary materials?	Yes / No
Have you described the materials in sufficient detail?	Yes / No

Science Fair Project Variables Checklist

What Makes for Good Variables?	For Good Variables, You Should Answer "Yes" to Every Question
Is the independent variable measurable?	Yes / No
Can you change the independent variable during the experiment?	Yes / No
Have you identified all relevant dependent variables, and are they all caused by and dependent on the independent variable?	Yes / No
Are all dependent variable(s) measurable?	Yes / No
Have you identified all relevant controlled variables?	Yes / No
Can all controlled variables be held at a steady value during the experiment?	Yes / No

Experimental Procedure Checklist

What Makes a Good Experimental Procedure?	For a Good Experimental Procedure, You Should Answer "Yes" to Every Question
Have you included a description and size for all experimental and control groups?	Yes / No
Have you included a step-by-step list of all procedures?	Yes / No
Have you described how to change independent variable and how to measure that change?	Yes / No
Have you explained how to measure the resulting change in the dependent variable or variables?	Yes / No
Have you explained how the controlled variables will be maintained at a constant value?	Yes / No
Have you specified how many times you intend to repeat the experiment (should be at least three times), and is that number of repetitions sufficient to give you reliable data?	Yes / No
The ultimate test: Can another individual duplicate the experiment based on the experimental procedure you have written?	Yes / No
If you are doing an engineering or programming project, have you completed several preliminary designs?	Yes / No

Checklist for Conducting a Science Experiment

What Makes a Good Science Experiment?	For a Good Science Experiment, You Should Answer "Yes" to Every Question
Did you take detailed notes about your observations and record them in your laboratory notebook?	Yes / No
Did you collect your data using a data table?	Yes / No
Were you consistent, careful, and accurate when you made your measurements?	Yes / No
Were you careful to insure that your controlled variables remained constant so as not to affect your results?	Yes / No
If you ran into any unexpected problems, did you adjust your experimental procedure accordingly?	Yes / No
If you are doing an engineering or programming project, have you involved some of your targeted users in the testing of your prototype?	Yes / No

Data Analysis Checklist

What Makes for a Good Data Analysis Chart?	For a Good Chart, You Should Answer "Yes" to Every Question
Is there sufficient data to know whether your hypothesis is correct?	Yes / No
Is your data accurate?	Yes / No
Have you summarized your data with an average, if appropriate?	Yes / No
Does your chart specify units of measurement for all data?	Yes / No
Have you verified that all calculations (if any) are correct?	Yes / No

Graph Checklist

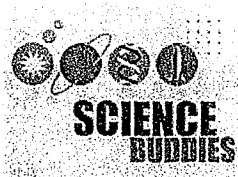
What Makes for a Good Graph?	For a Good Graph, You Should Answer "Yes" to Every Question
Have you selected the appropriate graph type for the data you are displaying?	Yes / No
Does your graph have a title?	Yes / No
Have you placed the independent variable on the x-axis and the dependent variable on the y-axis?	Yes / No
Have you labeled the axes correctly and specified the units of measurement?	Yes / No
Does your graph have the proper scale (the appropriate high and low values on the axes)?	Yes / No
Is your data plotted correctly and clearly?	Yes / No

Conclusions Checklist

What Makes for Good Conclusions?	For Good Conclusions, You Should Answer "Yes" to Every Question
Do you summarize your results and use it to support the findings?	Yes / No
Do your conclusions state that you proved or disproved your hypothesis? (Engineering & programming projects should state whether they met their design criteria.)	Yes / No
If appropriate, do you state the relationship between the independent and dependent variable?	Yes / No
Do you summarize and evaluate your experimental procedure, making comments about its success and effectiveness?	Yes / No
Do you suggest changes in the experimental procedure and/or possibilities for further study?	Yes / No

Science Fair Project Display Board Checklist

What Makes for a Good Science Fair Project Display Board?	For a Good Science Fair Project Display Board, You Should Answer "Yes" to Every Question
<p>Does your display board include:</p> <ul style="list-style-type: none"> • Title • Abstract • Question • Variables and hypothesis • Background research • Materials list • Experimental procedure • Data analysis and discussion including data chart(s) & graph(s) • Conclusions (including ideas for future research) • Acknowledgements • Bibliography 	<p>Yes / No</p>
<p>Are the sections on your display board organized like a newspaper so that they are easy to follow?</p>	<p>Yes / No</p>
<p>Is the text font large enough to be read easily (at least 16 points)?</p>	<p>Yes / No</p>
<p>Does the title catch people's attention, and is the title font large enough to be read from across the room?</p>	<p>Yes / No</p>
<p>Did you use pictures and diagrams to effectively convey information about your science fair project?</p>	<p>Yes / No</p>
<p>Have you constructed your display board as neatly as possible?</p>	<p>Yes / No</p>
<p>Did you proofread your display board?</p>	<p>Yes / No</p>
<p>Did you follow all of the rules pertaining to display boards for your particular science fair?</p>	<p>Yes / No</p>



Final Report Checklist

Name: _____

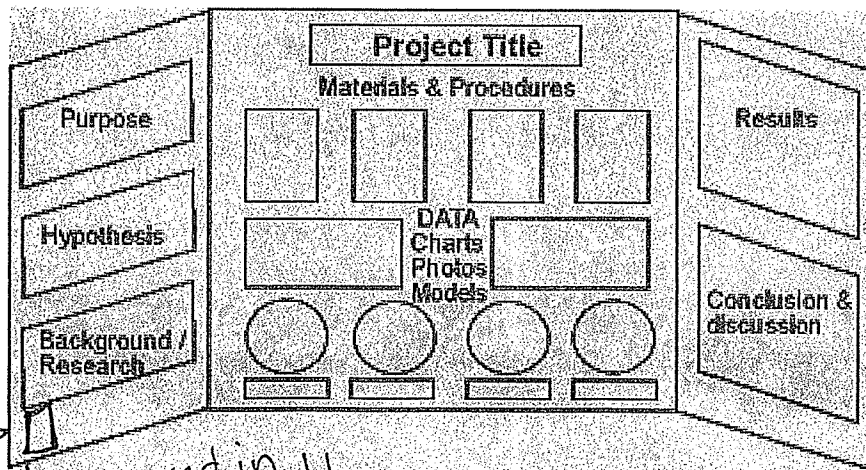
<input type="checkbox"/>	Does your abstract include a short summary of the hypothesis, materials & procedures, results, and conclusion?
<input type="checkbox"/>	Have you used the proper capitalization and punctuation?
<input type="checkbox"/>	Have you checked your grammar and spelling?
	Does your final report include the following key sections:
<input type="checkbox"/>	- Title page
<input type="checkbox"/>	- Abstract
<input type="checkbox"/>	- Table of contents
<input type="checkbox"/>	- Question, variables, and hypothesis
<input type="checkbox"/>	- Background research (your Research Paper)
<input type="checkbox"/>	- Materials list
<input type="checkbox"/>	- Experimental procedure
<input type="checkbox"/>	- Data analysis and discussion (including data tables and graphs)
<input type="checkbox"/>	- Conclusions
<input type="checkbox"/>	- Acknowledgements
<input type="checkbox"/>	- Bibliography



Science Fair Project Display Boards

Key Info

- For almost every science fair project, you need to prepare a **display board** to communicate your work to others. In most cases you will use a standard, three-panel display board that unfolds to be 36" tall by 48" wide.
- **Organize your information like a newspaper** so that your audience can quickly follow the thread of your experiment by reading from top to bottom, then left to right. Include each step of your science fair project: Abstract, question, hypothesis, variables, background research, and so on.
- **Use a font size of at least 16 points** for the text on your display board, so that it is easy to read from a few feet away. It's OK to use slightly smaller fonts for captions on picture and tables.
- **The title should be big and easily read from across the room.** Choose one that accurately describes your work, but also grabs peoples' attention.
- **A picture speaks a thousand words!** Use photos or draw diagrams to present non-numerical data, to propose models that explain your results, or just to show your experimental setup. But, don't put text on top of photographs or images. It can be very difficult to read.
- **Check the rules for your science fair.** Here is a list of items that some science fairs allow (or even require) and some science fairs don't require (or even prohibit):
 - Your name on the display board
 - Pictures of yourself
 - Captions that include the source for every picture or image
 - Acknowledgements of people who helped you
 - Your laboratory notebook (some science fairs want you to have it only during judging)
 - Equipment such as your laboratory apparatus or your invention



*Abstract must be placed in bottom left corner!!
Other information may be organized as needed.*



HSFA ACADEMICS

Biological or Physical Science Fair Judging Sheet

(circle category)

Name: _____

School/City: _____

Title: _____ Project #: _____

Statement of Originality

I certify that this is my own original and authentic work and that I received no help in completing this project other than general instruction and supervision. Student's Signature _____

FACTORS EVALUATED	JUDGE'S COMMENTS	POINTS
RESEARCH and DEVELOPMENT		
<i>Excellent: 26-30 pts. Thorough research, irrefutable references, knowledgeable and logical presentation paper in good form.</i>		/30
<i>Very Good: 21-25 pts. Lacking slightly in certain areas</i>		
<i>Good: 10-20 pts. Some inaccuracies and/or faulty reasoning</i>		
THE EXPERIMENT		
<i>Excellent: 26-30 pts. Reliable apparatus, valid controls, sufficient population/repetition, good originality.</i>		/30
<i>Very Good: 21-25 pts. Lacking slightly in certain areas</i>		
<i>Good: 10-20 pts. Definite inadequacy in above areas</i>		
THE LOG BOOK		/10
CONCLUSIONS and FINDINGS		
<i>Excellent: 15-20 pts. Substantial, reliable, and beneficial findings.</i>		/20
<i>Very Good: 10-14 pts. Satisfactory work with a few flaws.</i>		
<i>Good: 5-9 pts. Results inconsistent with data.</i>		
TECHNICAL SKILL and DISPLAY		
<i>Excellent: 10 pts. Craftsmanship and visual media are excellent.</i>		/10
<i>Very Good: 6-9 pts. Craftsmanship and visual media are satisfactory.</i>		
<i>Good: 0-5 pts. Shows lack of craftsmanship and poor presentation of visual media.</i>		
Judge's Signature _____		Total Points (100 possible): _____

