Science Fair Timeline at a Glance

Date	What's Due
August 18/19, 2016	Proposal Form
August 30/31, 2016	Cover Page
September 13/14, 2016	Background Information
September 27/28, 2016	Experiment Plan, Materials, and Procedures (rough draft)
October 11/12, 2016	Data and Results
October 25/26, 2016	Conclusion (rough draft)
November 9, 2016	Table of Contents and Bibliography
November 29/30, 2016	**Entire project due, including completed backboard and logbook**
December 2, 2016	Grade Level Fair
December 12, 2016	School Science Fair
January 2017	Rockdale Regional Science & Engineering Fair Public viewing 5-6pm

*Please note: assignments should be turned in on the day students attend science class (Block A/Block B). The exception is November 9 due to November 8 being a student holiday.

Due dates are subject to change. Dates may be added if the teacher sees that more material should be submitted. Access to resources and changes in school and/or regional science fair may cause these dates to be altered. Time management and attention to detail is essential!!! If a student has a question about something due, the student should address this question **before** the due date.

Time Management Guideline:

Now – August 15

- Choose a topic or problem to investigate.
- Make a list of resources (libraries, places to write, people to interview, places to work).
- Select your reading material.

August 17-September 10

- Organize your information and narrow your focus in order to form your hypothesis on a testable idea.
- Write, call, and email for additional information and/or help from business firms, government agencies, universities, etc.
- Start a log book for keeping records. Write down everything you do, think, and observe about your topic and experimentation. Date each entry.
- Write out a research plan before you begin. Include problem, hypothesis, procedure, and bibliography.
- Talk to your adult sponsor (science teacher) about all ISEF paperwork due.

September 12-

- Collect materials and equipment, select an appropriate work site, and follow all safety regulations carefully.
- Learn how to use and apparatus you need. Seek expert guidance whenever possible.
- Set up your investigation/experiment, or do preliminary designs for the construction of an engineering project.
- Keep progress current in your log book.
- Begin testing, experimenting, or constructing.
- Adjust your research plan as you obtain information from expert sources.
- Check with your sponsor for approval.
- Changes in your plan may mean approval is needed from IRB or SRC committee.
- Add information to the log book as you work.
- Continue to collect data on your project.
- Continue recording notes and observations.

- Take photographs of the research project in progress.
- Continue research for background information about the topic. Become the expert.
- Continue experimentation or construction as needed.
- Being work on first draft of written report (statement of problem, hypothesis/engineering goal, preliminary information, bibliographic information).
- Continue recording notes and observations.
- Continue taking photographs of research project.
- Continue experimentation or construction as needed.
- Consult experts as needed.
- Review books, articles, etc. for additional ideas.
- Continue recording notes and observations.
- Take photographs of final states of research project.
- Discuss work done to date on report.
- Start the analysis of data collected.
- Begin designing charts, graphs, or other visual aids for display and for your written report.
- Continue writing first draft of report including sections on experimental procedure or engineering approach and analysis of data.

November 14 – November 28

- Review analysis of data and results obtained.
- Write second draft of your report to also include analysis of information, evaluation of possible solutions, conclusions and presentation of results of your research project.
- Continue writing about progress in your log book.
- Begin designing display, stay within size and safety limitations.
- Write text for background of display and plan its layout.
- Complete charts, graphs, and visual aids.
- Work on draft of written report.
- Write your abstract on official ISEF form.
- Write another draft of written report.
- Finish display board construction and design.
- Write your display text using concise wording and bullets for your display.
- Check and double check display for spelling, punctuation, and grammar.
- Mount graphs, charts, drawings, and photographs.
- Check rules governing display materials and allowable apparatus.
- Write and type final report.
- Proofread report.
- Set up display at home and check for any flaws or mistakes.
- Practice presenting your research and answering questions with an expert.
- Make sure you have completed all forms needed, your log book, your written report, official abstract, and your display board.

Science Fair Log Book

Students should write in their logbook four times per week. Each entry should be in blue or black ink (NOTHING TYPED) and should be written on the FRONT of the page ONLY. All entries should be legible. Keeping copies of everything will help ensure nothing crucial is lost. Your log book is a start-to-finish, dated record of all work done on the project. Every entry should include the date it was made. It must be HANDWRITTEN, not typed. Get a bound composition notebook to use as your log book.

Organize your logbook. Make a table of contents and create tabs for different sections within your logbook. This helps keep you organized for different activities. The following is a SUGGESTION:

Table of Contents	Tab color	Page #
Deadline Schedule	Red	1
Daily Notes & Reflections	White	2
Background Research (Library/Internet)	Blue	20
Contacts, Supply sources	Green	26
Experimental Setup	Yellow	35
Data collection	Purple	40
Results (pictures,graphs,tables)	Orange	50
Reflections	Light blue	60

It should be organized with the following sections (use professional looking tabs to clearly label each section):

- **Deadline Schedule** – write the deadline schedule from page 1 of this packet
- **Daily Notes and Reflections** - personal thoughts, interviews, plans, actions (for example "8/18/16- turned in proposal. 8/22/16- Dr. Jefferson approved my project. I checked resources out of the library"). THIS IS YOUR DAILY, START-TO-FINISH RECORD OF EVERYTHING YOU DID FOR THE PROJECT, NO MATTER HOW BIG OR SMALL.
- **Background Research** – you will use this section to write the research part of your final paper; include all information you researched/collected for your project, including library and Internet resources and people; also include a works cited page/bibliography in this section
- **Contacts/Supply Sources** – include the list of all contacts and supplies that you need for your project, as well as where you got the supplies
- **Experimental Setup/Plan**
  - *Problem/Research Question* - 1 - 2 sentences
  - *Hypothesis* - 1 - 2 sentences
  - *Variables* - list IV, DV, constants, control setup (if appropriate)
  - *Equipment & Materials* - list (how you designed the experiment)
  - *Procedure* - numbered list (what you did in your experiment)
- **Data and Observations** - use tables, notes, etc., to record your experimental results
- **Results, Findings, & Interpretations** - interpret your results; what do they say?
- **Conclusions & Recommendations** - state whether or not your hypothesis was correct and why; make recommendations for improving your project; make recommendations for further study.
- **Reflections** - What, if anything, would I do differently next time? What part of the experiment could be changed to improve the experimental procedure?

Go to http://www.sciencebuddies.org/science-fair-projects/printable_project_logbook.pdf for more information. This is a great website to help you understand how a logbook should look and the contents of one.

How to Determine My Project

What is the Scientific Method?

The scientific method, simply put, is a process that is the basis for scientific inquiry. The *scientific method* follows a series of steps:

(1) identify a problem you would like to solve, form a question (i.e. does baking soda affect the temperature of water?)
(2) gather information
(3) formulate a *hypothesis*
(4) test the hypothesis, using *variables* and *controls*
(5) collect and analyze the data
(6) make conclusions.

Foaming volcanoes, reports on the solar system, animals, plants, sea creatures, etc. are not experiments. Remember, you are trying to support or reject your hypothesis using the scientific method.

What is a hypothesis?

A *hypothesis* is what you think will happen. For example, if your question or experiment is "Does baking soda affect the temperature of water?" then what you think will happen is your hypothesis. In this case, the hypothesis could be: If baking soda is added to water, then the temperature of the water will increase.

What are the controls and variables?

A *control* is the item of the experiment that will NOT change. In the example above, the control would be the water. For each experiment, the amount of water will remain constant or the same.

The *independent variable* is what you will change. In this example it will be the baking soda. This is what you will change. To perform this experiment, you would take a specific amount of water, say 500ml. Take and record the temperature. Add a specific amount of baking soda, say 1 tablespoon. Take and record the temperature. Add an additional specific amount of baking soda, say another tablespoon. Take and record the temperature. Add an additional specific amount of baking soda, say another tablespoon. Take and record the temperature.

The *dependent variable* is what changes in response to the independent variable. In this example, it is the temperature of the water.

How many times do I have to do my test?

The more times you repeat your experiment, the more data you will collect. The more data collected, the more accurate and reliable are the results. It is suggested that the procedure, or the experiment, be done a **minimum of three times**. For example, in the experiment above, the student would repeat the process with a new sample of water (same amount as initially used), take the temperature and record the results again. The process of adding the baking soda, one tablespoon at a time, recording the results is repeated. The student would then repeat the procedure again so as to have a total of three temperatures for each measured amount of water and each measured amount of water and baking soda.

How do I write a procedure?

Think about how you will perform your experiment. Then take the time and write a step-by-step list of instructions. For example, for the experiment identified above the procedure would be:
(1) Measure out one ml of water
(2) Take the temperature of the water and record
(3) Add a tablespoon of baking soda to the water
(4) Take the temperature of the solution of water and baking soda, record and observe what happened

(5) Add another tablespoon of baking soda to the water
(6) Take the temperature of the solution of water and two tablespoons of baking soda, record and observe.
(7) Repeat steps 1-6 two more times

Now that I have collected my data, how do I display it?
Once completed, your project with results will be displayed on a standard backboard. You will include all parts from your paper on your backboard, including any table, graphs, and pictures.

What kind of backboard do I need?
Backboards cannot be any larger than 36 inches high and must be the tri-fold type.

Can I bring in my models/props when I bring in my backboard?
Models and props are *not* to be brought in, but you should have pictures that demonstrate any models and props used in the experiment.

Where do I get my ideas for my Project?
Be creative. Think about what you want to learn more about. Go to your local library, the internet, family, and friends to get some great ideas. You can even use an example included at the end of this packet.

How are the projects judged?
All the projects will be judged by:
(a) The use of the scientific method
(b) Creativity and demonstration of understanding through display and written work
(c) Appearance

Back of the Backboard
1. Name, Grade and Teacher must be written on the back of the board
2. Attach your proposal with your parent and teacher signatures.

Helpful Web Sites:
1) http://www.ipl.org/div/projectguide/
2) www.ScienceBuddies.org
3) http://school.discoveryeducation.com/sciencefaircentral/scifairstudio/ideas.html
4) www.all-science-fair-projects.com
5) www.homeworkspot.com
6) http://www.societyforscience.org/isef/document/

Writing Your Science Fair Project Report

Your report communicates to others how you did your experiment and what you found out from it. This is where you use your notes and observations from your experiment. DO NOT WRITE IN 1st PERSON (DO NOT USE "I")!

A Suggested Outline for Your Project Report

1. **Cover Page** – In the upper middle of the page, write the title of your project or your project question. Also include your name on the cover page.

2. **Introduction**

   Project Questions – Begin your report by stating your project question.

   Hypothesis – State your hypothesis.

3. **Research** – Write about what you found out from books, the Web, and other resources that helped you design an experiment and answer your project question.

4. **Experiment Plan** – Describe the design for your experiment. Be sure to describe the variables and how you set up a fair test.

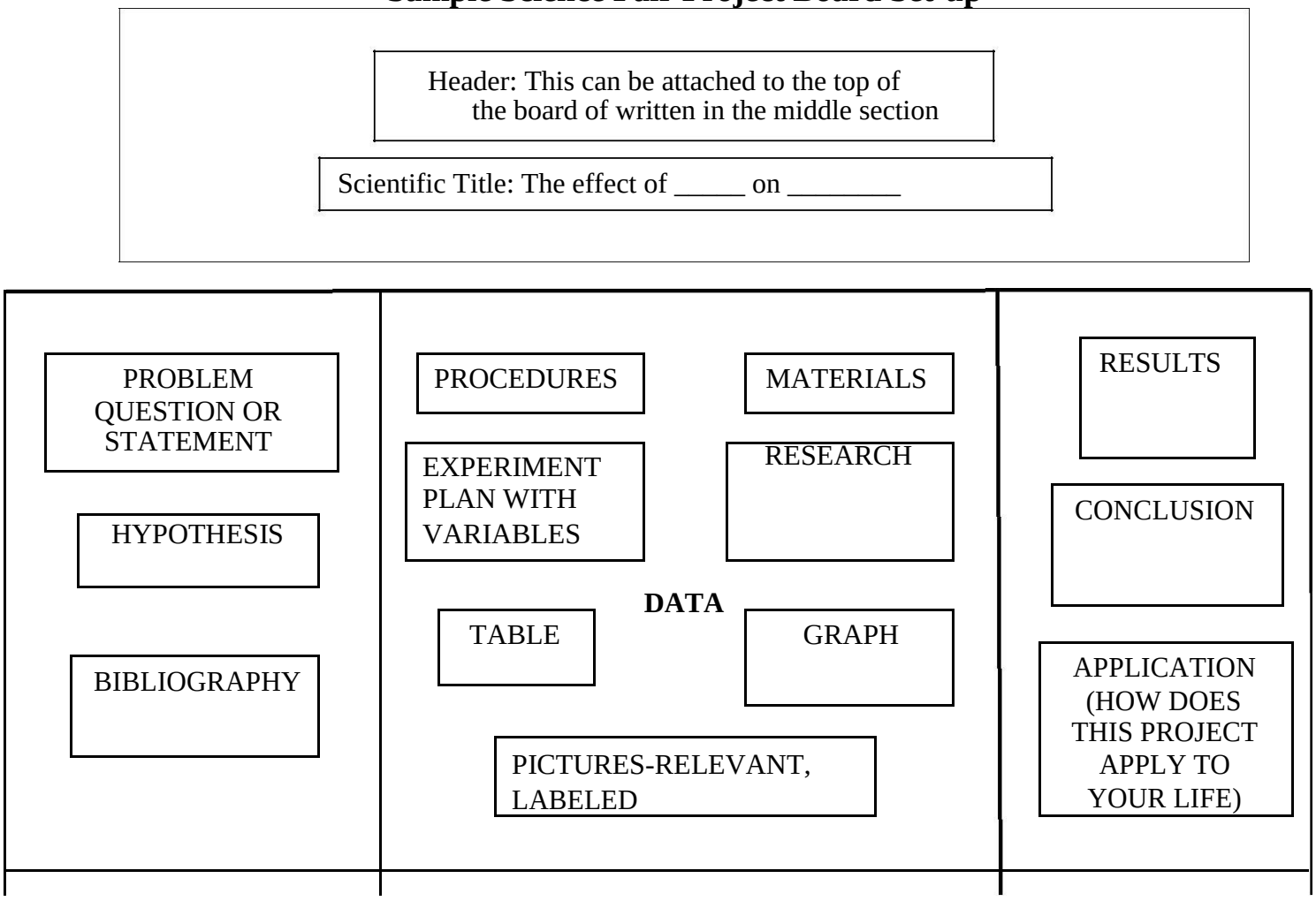
5. **Materials and Procedure** – Describe what you used in your experiment, how you carried out your experiment, and what you found out.

6. **Present Data**- Include your data tables and graphs.

7. **Results and Conclusions** – Compare your results to your hypothesis. Did your findings support your hypothesis or not?

8. **Bibliography** – Write your bibliography. A bibliography includes the names of books, magazines, websites, and other resources you used for your project.

Sample Science Fair Project Board Set-up



Your project display will communicate to others what your project was all about. The display should be three-sided and have a brief description of the various parts of your investigation. You should make from a ready- made project display board. Adapt your display to make it the best for your own project.

Helpful Hints:

- ✓ Take photographs: Many projects involve elements that may not be safely exhibited at the fair, but are an important part of the project. Photographs should be taken of important parts/phases of the experiment to use in the display.
- ✓ Be organized: Make sure the display is logically presented and easy to read. A glance should permit anyone (particularly judges) to locate quickly the title, experiments, results and conclusions.
- ✓ Eye-catching: Make the display stand out. Use neat, colorful headings, charts and graphs to present the project. Pay special attention to labeling graphs, charts, diagrams, and tables. Each item must have a descriptive title. Anyone should be able to understand the visuals without further explanation.

Science Project Ideas

- Which metal conducts heat best?
- What materials provide the best insulation?
- Does your heart rate increase with increasing sound volume?
- Does sound travel best through solids, liquids, or gases?
- Does talking to a plant affect its growth?
- What is the best way to prevent soil erosion?
- Do different species of birds prefer different types of seeds?
- How does the position of the sun affect the length of your shadow?
- How does the position of a light source affect the way a plant grows?
- Does the viscosity of a liquid affect its boiling point?
- Does the length of a vibrating object affect its sound?
- How does the shape of objects with similar mass affect their ability to float?
- What types of soil filters water best?
- Does the color of a material affect its absorption of heat?
- Do bigger seeds produce bigger plants?
- Does the design of a paper airplane make it fly further?
- How does the shape of a kite affect its flight?
- What fabrics are most readily damaged by pollutants?
- What are the effects of magnets on seed germination?
- What are the social behaviors in ant colonies?
- What washing technique works best to remove bacteria from table silverware?
- Which substance is the best home insulator?
- How do factors such as soil temperature and depth of planting affect seed germination, seedling vigor, and disease resistance?
- Which form of pest control is the safest?
- How does the shape of an airplane wing affect its lift?
- Design and build a solar food dryer or oven.
- Develop simple and effective ways to preserve meat and fish overseas.

To find more ideas:

1) http://www.ipl.org/div/projectguide/
2) www.ScienceBuddies.org
3) http://school.discoveryeducation.com/sciencefaircentral/scifairstudio/ideas.html
4) www.all-science-fair-projects.com
5) www.homeworkspot.com
6) http://www.societyforscience.org/isef/document/

Science Fair Proposal Form

Due: August 29, 2014

Name: _____ Grade: _____

Project Title: _____

_____

Question (What I want to find out): _____

_____

Hypothesis (What I think the answer will be to my question): _____

_____

Variable(s): _____

Control(s):_____

Procedure:

1. _____

2. _____

3. _____

4._____

5._____

6. _____

7. _____

Attach a separate sheet for additional steps.

I will support my child's efforts in gathering materials but will not directly carry out this Science Fair Project.

Parent's Signature: _____Date_____

Student Signature_____Date_____

Teacher Signature_____Date_____

Warning: No project using dangerous materials or presenting a dangerous situation will be allowed in this Science Fair.