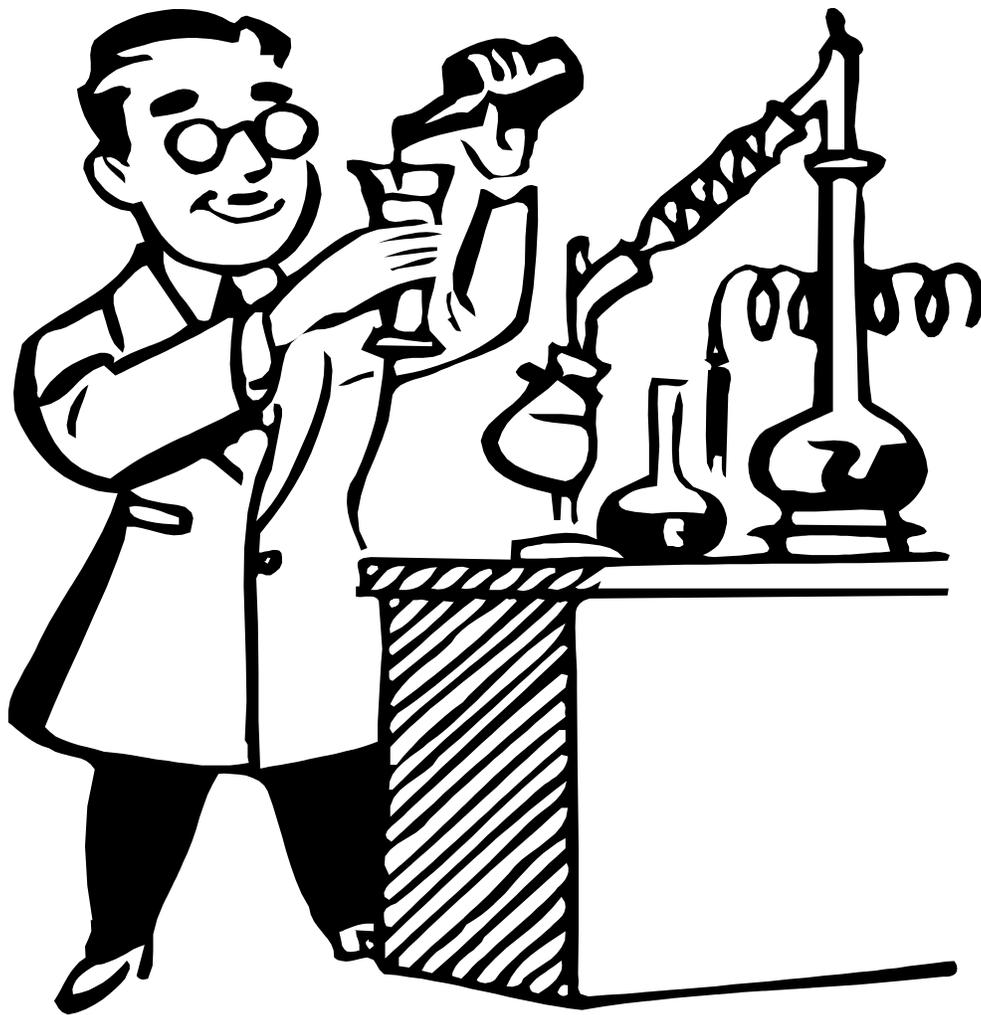


Science
Fair
2020





A How- To Guide to your Science Fair Project

Introduction:

The purpose of this booklet is to provide information on how to complete a science fair project. Ideas are given on how to choose, develop, and display a project, as well as how to prepare for judging. Although a lot of hard work goes into preparing a project, remember that the purpose of a project, which reflects you and your interests, is to provide you with an enjoyable learning experience. So above all enjoy working and doing science because SCIENCE IS FUN!

Steps to a successful project:

1. Understand the rules:

Before you start your project, familiarize yourself with the rules. Read the list of some of the important things you need to know, checking off each item as you read. Ask your teacher to explain anything you do not understand. Refer to this list of rules as you are working on your project. The list is at the end of your booklet.

2. Pick your topic:

Get an idea of what you want to explore! Choose a topic for your project that deals with an area of science that interests you. You can find ideas in books, magazines, textbooks etc. List the categories or ideas that you have selected and pick a specific topic.

3. Research your topic:

Go to the library or internet and learn everything you can about your topic. Look for the unexplained or unexpected. Talk to professionals in the fields that you are interested in or email companies. Take notes on what you learn and keep track of the sources you use with a bibliography.

4. Organize:

Organize everything you have learned about your topic. Then create a question and hypothesis based on the information you have learned. Examples are in the back of this booklet.

5. Plan your experiment:

Once you have a project idea you must design an experiment. Next create a plan in which you list all the materials and steps in your experiment. Design an experiment that can be done in the amount of time that you have. Discuss this with your teacher to make sure that you are on the right track.

A How- To Guide to your Science Fair Project

6. Complete your “paperwork”:

Use a calendar to identify important dates. Leave time to fill out your forms and review with your teacher. Also, leave time to write a paper and put together a display

7. Conduct your experiment & take photographs:

During experimentation take detailed notes on what you see and do. Keep a research journal, including dates and times as needed. Take photographs, not including faces, of your experiment and the results. Make sure to change only one variable at a time in your experiment and start with a control experiment where nothing is changed. Make sure you include at least 5 or more test subjects in the control and experimental groups. Note any changes you made in your results.

8. Examine your results:

When you complete your experiments examine and record your findings. Use a chart, graph, table, etc. to record your results. Did your experiment go as you planned and why or why not? Was your experiment performed with the exact same steps each time? Remember understanding unusual results is not a scientific failure, but an important lesson to learn.

9. Draw Conclusions:

Answer the following conclusions: Which variables are important? Did you collect enough data? Do you need to conduct more experimentation? Did you support your hypothesis? If your results did not, what happened? Remember an experiment is done to prove or disprove a hypothesis.

10. Prepare a report:

Prepare a report on what and how you have learned. First start with a rough draft, going into as much detail as possible so another person could repeat your experiment. Leave plenty of space between line so corrections can be made if needed. A good report will include 1) a title, 2) acknowledgments of who helped, 3) an introduction of your topic, 4) discussion of your problem, 5) list of all materials, 6) your step by step procedure, 7) observation and results, 8) conclusions, and 9) bibliography.



A How- To Guide to your Science Fair Project

11. Design your display:

Now that your research and scientific report is done, you must now create a display to show what you have done. Neatness, clarity, and organization are keys to a successful display. Check spelling, punctuation, grammar, and accuracy of your information.

Your display material does not need to be expensive. You will need a free-standing backboard. It can be poster board, fabric on a frame, cardboard, plywood, masonite, etc. Make sure that it stays within the measurements specified in the rules. Use color, creativity, and care as you organize a creative display.

Your display may include whatever objects that are not excluded by the rules. Your display should include: title, question, hypothesis, report, list of materials, procedure, observations, conclusions, and abstract. Refer to the back of this booklet for the list of items that may NOT be included in your display and an illustration of a display.

12. Prepare for judging:

Your project will be judged using a point system based on six areas. These areas are: scientific thought, creative ability, understanding, clarity, dramatic value, and technical skill.

The oral presentation is an important part of the judging process. During your presentation you should discuss: why you chose your topic, how you gathered your information, how you tested your hypothesis, what observations you made, and what conclusions you reached. You may want to write note cards or refer to parts of your display to plan what you are going to talk about. Rehearse what you are going to say, DO NOT READ your presentation. The presentation should only take 3-5 minutes. Practice in front of your family and friends. Keep in mind the judges are looking for a student who has learned from their research and experiment.

Although it is natural to be a little nervous about presenting, the judges are there to trick or embarrass you. They are interested in you and what your project is all about. So be pleasant, courteous and enjoy yourself. Above all, show them that you are proud of what you have accomplished!



A How- To Guide to your Science Fair Project

Bibliography

Please remember to keep a record of all sources that you gather your information from. Your bibliography should be organized with the following information based on where you got your information from. Then list these sources in alphabetical order by the first word in each entry.

Information for a Bibliography

Book:

Author, Title, Place of printing: Publishing Co., Date, Pages

EXAMPLE:

Shippen, Katherine B., A Bridle for Pegasus, New York: Biking Press, 1991, pp. 28-42

Encyclopedia:

Author, "Title of article," Name of encyclopedia, Year, Volume, Page

EXAMPLE:

Piccard, Don, "Balloon," The World Book Encyclopedia, 1994, Vol.2, pp. 39-44

Magazines:

Author, "Title of article," Name of magazine, Volume: Number, Pages, Date

EXAMPLE:

Lewis, C., "The Navy Unveils Rockets," Aviation World, Vol. 68: No. 6, pp.,; 49-51, November 3, 1958

Internet:

Author (if known), "title of article or webpage," web address, date documented

EXAMPLE:

_____, "NASA Space Shuttle Launches,"
<http://science.htc.nasa.gov/shuttle/missions.html>, September 11, 2000

A How- To Guide to your Science Fair Project

Bibliography

Media:

Program title, type of media, date

EXAMPLE:

60 minutes, Television, Cable GS Communications Channel 7, September 10, 2000

Interviews:

Name of person, Position, Company, Location, Date interviewed

EXAMPLE:

John C. Jones, Lawyer, Jones & Sons, Martinsburg, WV, August 15, 2000

A How- To Guide to your Science Fair Project

Checklist



Date

- ___ **1.** You have chosen your category
- ___ **2.** Your topic, question, and hypothesis have been developed
- ___ **3.** You have researched your question
- ___ **4.** Your experiment has been designed and approved by your teacher & the science fair review committee
- ___ **5.** You have gathered your materials & set up your experiment
- ___ **6.** You record your data and observations in a journal as you experiment
- ___ **7.** The data is organized in charts or graphs to be analyzed for conclusions
- ___ **8.** You write your abstract including your question, hypothesis, materials, procedure, results and conclusion using 250 words on the approved form.
- ___ **9.** You can make or buy a display board for your project that is no bigger than 30 inches front to back, 48 inches wide, or 108 inches tall
- ___ **10.** Your project has a title, question, hypothesis, list of materials, procedure, observations, conclusion, a report, and a list of sources used to gather information
- ___ **11.** Your display shows what and how you have learned about your topic. You may show this using picture, graphs, charts, etc. A collection or model may be displayed if it follows Science Fair guidelines.
- ___ **12.** You may receive direction or guidance from others, but you must do all the work yourself. Include who helped you in your report.
- ___ **13.** Your report should include a title, background information on your topic, description of the experiment, summary of your results, a list of who helped you, and a bibliography.
- ___ **14.** You must put together a 3-5-minute presentation for the judges. Substitutes or video/audio presentations are not premitted.
- ___ **15.** Projects but adhere to safety restrictions and display regulations including: no live or dead plants or animals, no human or animal tissue other than teeth, dried animal bones, hair. No glass, water, liquids, hazardous or household chemicals; no photographs of dissected animals or humans, no open batteries, and no food.
- ___ **16.** Individuals may enter no more than 1 project
- ___ **17.** No student or school names should appear on abstracts or projects
- ___ **18.** No student or participant's facial photos may appear on projects
- ___ **19.** Fair directors have final say on matters not covered in fair rules

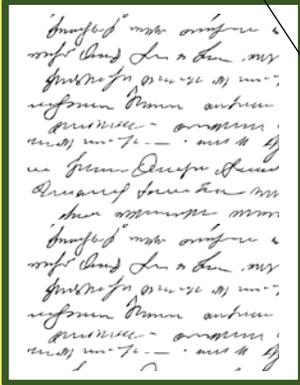
Displaying a Science Fair Project

What you thought would happen

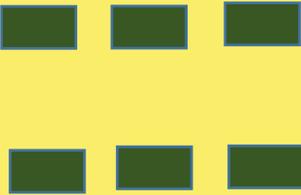
What you wanted to find out

What you did

Procedure



Pictures and drawings



Title

Do Plants Need Light?

Purpose

To find out if plants need light

Hypothesis

My mother grew the plants for me

Who helped you



Observational
Experimental Report



Materials

Results

What happened

Charts and tables

Conclusion

What you learned

Plants need light to stay green.

Berkeley County Schools Science Fair
Project Judging Form - Team

Project Title _____

Project Category _____ Project Number _____

Criteria:

Scientific Thought (25 Points) _____

- Is the problem concisely stated?
- Are the procedures appropriate and thorough?
- Is the information collected complete?
- Are the conclusions reached accurate?
- Comments:

Creativity: (25 Points) _____

- How unique is the project?
- Is it significant and unusual for the age of the student?
- Does the project show ideas arrived by the student?
- Comments:

Teamwork : (20 Points) _____

- What did the team learn about the project?
- Did the team use appropriate literature for research?
- Can the **WHOLE** team answer questions about the topic?
- Was the work evenly distributed among the team members?
- Comments:

Clarity: (10 Points) _____

- Are the problems, procedures, data, and conclusions presented logically?
- Can the objectives be understood by non-scientists?
- Are the written materials clear and articulate?
- Comments:

Dramatic Value: (10 Points) _____

- How well did the student present the project?
- Is the display visually appealing?
- Is the proper emphasis given to important ideas?
- Comment:

Technical Skill (10 Points) _____

- Was the majority the work done by the student?
- Does the written material show attention to grammar and spelling?
- Is the project well-constructed?
- Comments:

Total Points _____
(based upon 100 points)

Berkeley County Schools Science Fair Project Judging Form

Project Title _____

Project Category _____ Project Number _____

Criteria:

Scientific Thought (30 Points) _____

- Is the problem concisely stated?
- Are the procedures appropriate and thorough?
- Is the information collected complete?
- Are the conclusions reached accurate?
- Comments:

Creativity: (30 Points) _____

- How unique is the project?
- Is it significant and unusual for the age of the student?
- Does the project show ideas arrived by the student?
- Comments:

Understanding: (10 Points) _____

- What did the student learn about the project?
- Did the student use appropriate literature for research?
- Can the student answer questions about the topic?
- Comments:

Clarity: (10 Points) _____

- Are the problems, procedures, data, and conclusions presented logically?
- Can the objectives be understood by non-scientists?
- Are the written materials clear and articulate?
- Comments:

Dramatic Value: (10 Points) _____

- How well did the student present the project?
- Is the display visually appealing?
- Is the proper emphasis given to important ideas?
- Comment:

Technical Skill (10 Points) _____

- Was the majority the work done by the student?
- Does the written material show attention to grammar and spelling?
- Is the project well-constructed?
- Comments:

Total Points _____
(based upon 100 points)

OFFICIAL ABSTRACT 2020

<i>Title:</i>
<i>Abstract:</i>

Category

Pick one only—mark an “X” in space in front of the category

- 1. Animal Sciences
- 2. Behavioral & Social Sci.
- 3. Biochemistry
- 4. Biomedical & Health Sci.
- 5. Cell & Molecular Biology
- 6. Chemistry
- 7. Computational Bio. & Bioinform.
- 8. Earth Science & Environmtl Sci.
- 9. Embedded Systems
- 10. Energy
- 11. Engineering
- 12. Material Science
- 13. Mathematics
- 14. Microbiology
- 15. Physics & Astronomy
- 16. Plant Sciences
- 17. Robotics & Intelligent Machines
- 18. Systems Software



1. As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply):

- human subjects
- vertebrate animals
- potentially hazardous biological agents
- microorganisms
- rDNA
- tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work

3. I/we worked or used equipment in a regulated research institution or industrial setting:

4. This project is a continuation of previous research.

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

6. I/we hereby certify that the abstract and responses to the to the above statements are correct and properly reflect my/our own work

_____ (Student Signature(s))

Research Plan (1A2)
REQUIRED for ALL Projects Before Experimentation
A complete research plan must accompany Checklist for Student (1A)

The research plan for ALL projects is to include the following:

A. Question being addressed

B. Hypothesis/Problem/Engineering Goals

C. Description in detail of method or procedures

Procedures:

Data Analysis:

D. Bibliography: List at least five (5) major references

- 1.
- 2.
- 3.
- 4.
- 5.

APPLICATION FOR ENTRY OF SCIENTIFIC EXHIBIT

BERKELEY COUNTY SCIENCE FAIR

January 10-11, 2020

Student's Name _____ School _____

Last _____ First _____

Home Address _____ Home Phone _____

_____ Grade _____

Title of Project _____

Categories - Check One

- | | |
|--|--|
| <input type="checkbox"/> 1. Animal Sciences | <input type="checkbox"/> 10. Energy |
| <input type="checkbox"/> 2. Behavioral & Social Sci. | <input type="checkbox"/> 11. Engineering |
| <input type="checkbox"/> 3. Biochemistry | <input type="checkbox"/> 12. Material Science |
| <input type="checkbox"/> 4. Biomedical & Health Sciences | <input type="checkbox"/> 13. Mathematics |
| <input type="checkbox"/> 5. Cell & Molecular Biology | <input type="checkbox"/> 14. Microbiology |
| <input type="checkbox"/> 6. Chemistry | <input type="checkbox"/> 15. Physics & Astronomy |
| <input type="checkbox"/> 7. Computational Biology & Bioinformatics | <input type="checkbox"/> 16. Plant Sciences |
| <input type="checkbox"/> 8. Earth Science & Environmental Sciences | <input type="checkbox"/> 17. Robotics & Intelligent Machines |
| <input type="checkbox"/> 9. Embedded Systems | <input type="checkbox"/> 18. Systems Software |

Note: Teams will be integrated into 1-18

PLEASE ANSWER THE FOLLOWING QUESTIONS

1. Have you reviewed the Display and Safety Regulations required by ISEF rules? YES NO
2. Are all the following forms attached to this application?

Elementary

Abstract

Junior

- Abstract
 Checklist 1
 Research Plan 1A2
 Approval Form 1B

Senior

- Abstract
 Checklist 1
 Research Plan 1A2
 Approval Form 1B

3. Is your project larger than 76 cm deep, 122 cm wide, or 274 cm high including table? This is max size.
 YES NO

4. Does your display use photographs? YES NO

If yes, no photographs of animals in other than normal conditions; no dissection photographs nor laboratory techniques can be shown; no faces of individuals.

5. Does your display require an electrical supply? YES NO

If yes, you must supply your own grounded extension cord (minimum of 9 feet).

CERTIFICATION

I hereby apply for space in the Berkeley County Science Fair with full intention of entering an exhibit. I agree to abide by the Display and Safety Rules and Regulations, which I have read. I certify that the project is essentially my own work.

Student's Signature

I certify that to the best of my knowledge this project was essentially the work of the student named above, and I give my approval for it to be entered in Science Fair Competition.

Adult Sponsor's Signature (Teacher)

Parent/Guardian's Signature