Science Fair 2023-2024

Elementary Level Grades 3-5 2023-2024

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 the purpose of the project is to reflect you and your interests. It is to provide you with and enjoyable learning experience. So above all enjoy working and doing science because Science IS FUN!

1. **Understand the Rules:**

Before you start your project, familiarize yourself with the rules within this booklet. Read the lists of some of the important things you need to know, check off each item 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. ISEF Rules Booklet 2022-2023: https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2023/Rules/Book.pdf

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, online, etc. List the categories or ideas you have selected and pick a specific topic. The list of possible categories can be found on page 10.

3. **Research your Topic:**

Go to the library or online 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. Keep information about the sources you find for your bibliography, see page 9 and abstract form.

Teams must have no more than three (3) members. The final work should reflect the coordinated efforts of all team members and will be evaluated using the same judging criteria as individual projects.

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 you have. Discuss this with your teacher to make sure you are on the right track.

6. **Complete your Paperwork (required):**

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 (optional for elementary) and put together a display.

Required Forms for Elementary:

- Elementary Science Fair Abstract Form ~ see pages 11 and 12
- Student Checklist Form 1A ~ see page 13
- Vertebrate and Human Research Form, if applicable ~ see pages 14-15
- Human Informed Consent Form, if applicable ~ see page 16

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 included at least 5 or more test subjects in the control and experimental groups. Note any changes you make 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 scientific failure, but an important lesson to learn.

9. **Draw Conclusions:**

Answer the following conclusions: Which variables are important? Did you collect enough data? Did 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 (optional for elementary):**

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 lines so corrections can be made if needed.

A good report will include
1) a title,
2) acknowledgements 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) observations and results,
8) conclusions and
9) bibliography.

11. **Design your Display (required):**

Now that your research and scientific report is done, you must 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 withing the measurements specified in the rules. Use color, creativity, and care as you organize a creative board.

Your display may include whatever objects that are not excluded by the rules. Your display should include: title, questions, hypothesis, report, list of materials, procedure, observations, conclusions, and abstract.
Refer to page 7 of this booklet for a list of items that may not be included with your display board.
Refer to page 8 of this booklet for an illustration of a display board.

12. **Write your abstract (required for all levels):**

Use the Elementary Science Fair Abstract Form on pages 11 & 12 of this document. Include a clean copy of the abstract with your display. You will also need to submit your abstract when your project passes from the school to county to regional to state fairs.

13. **Prepare for Judging:**

Your project will be judged using a point system based on six areas.
These areas are:

1. scientific thought,
2. creative ability,
3. understanding,
4. clarity,
5. dramatic value,
6. 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,
- 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 presentations. The presentation should only take about 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 nervous about presenting, the judges are not 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 you are proud of what you have accomplished!

The following are PROHIBITED in all Elementary School (grades 3-5) Science Fair Projects with NO exceptions:

• Biological Agents projects that use or study microorganisms including **mold, bacteria, viruses, prions, fungi, and parasites**, including those grown in petri dishes.

• Vertebrate Animal Research (including humans) involving pain or withholding of food or water. (All Vertebrate Animal Research should be reviewed by a Doctor of Veterinary Medicine and a school-based Institutional Review Board (IRB)/Scientific Review Committee (SRC).

• Class IV Lasers (All use of lower-class lasers must be under direct supervision of a qualified adult.)

• Radioactive substances or equipment that emits any form of ionizing radiation.

• Hazardous chemicals or reagents, DEA Controlled substances, tobacco, alcohol, prescription drugs, firearms or explosives.

• DNA

The following types of research are discouraged but can be permitted with advanced permission. Students must have their projects approved by the school-based Safety Review Committee BEFORE starting their research (check if a project requires pre-approval)!

• Human Subjects may be used only if all experimentation is conducted under adult supervision and student researchers have notified parents of the conditions of the experiment and provided the opportunities for subjects to opt out of participation. All participants must sign an informed consent form. All guidelines for human participants research must be followed and forms submitted to a school-based IRB committee BEFORE experimentation begins.

• Animal Behavior Studies Research projects should be reviewed by a Veterinarian to ensure the safety of the student and animal. All Vertebrate animal studies MUST be of an observational nature and not be done with any animals other than privately owned animals.

• If you wish to do an animal research project, please use invertebrates!

Teams must have no more than three (3) members. The final work should reflect the coordinated efforts of all team members and will be evaluated using the same judging criteria as individual projects

Project Checklist

____ 1. Choose your category

____ 2. Develop a topic, question, and hypothesis

____ 3. Research your question

____ 4. Be sure your experiment design has been approved by your teacher and the school-based science fair review committee or Institutional Review Committee.
Use the Elementary Science Fair Abstract Form on pages 11 & 12 of this document. Include a clean copy of the abstract with your display. You will also need to submit your abstract when your project passes from the school to county to regional to state fairs. (**REQUIRED**)

____ 5. Gather your materials and set up your experiment.

____ 6. Record your data and observations in a journal as you experiment.

____ 7. Organize data in charts or graphs to be analyzed for conclusions.

____ 8. Organize a free-standing display that is physical, digital, or a combination of both that does not exceed the display area of 30 inches or 76 centimeters front to back, 48 inches or 122 centimeters wide, or 108 inches or 274 centimeters tall.

____ 9. Be sure your project has a title, question, hypothesis, list of materials, procedure, observations, conclusion, a report, and a list of sources used to gather information

____ 10. Be sure your display shows what and how you have learned about your topic. You may show this using pictures, graphs, charts, etc. A collection or model may be displayed if it follows Science Fair guidelines.

____ 11. Do all the work yourself. You may receive direction or guidance from others; if you do- include who helped you in your report.

____ 12. Be sure your report includes a title, background information on your topic, description of the experiment, summary of your results, a list of who helped you, and a bibliography. (**OPTIONAL**)

____ 13. Put together a 3-5-minute presentation for the judges. (**REQUIRED**)
Substitutes or video/audio presentations are not permitted.

____ 14. Projects must adhere to safety restrictions and display regulations including:

- Absolutely NO liquids not even water
- No hazardous or household chemicals, food, grocery items, spices, or edible items
- No live or dead plants, fruits, seeds, soil, sand, rock, or cement
- No glass (no jars, containers, light bulbs, aquariums, etc.; tablet/laptop computers allowed)
- No exposed sharp objects, pinch points, electrical wires, or other potential hazards
- No insects, animals, body parts or fluids, etc. (living or once living)
- No algae, bacteria, fungi (molds, yeasts), protozoa, viruses, or other microscopic organisms
- No items that may have contained or been in contact with hazardous substances
- No lasers, bright lights, flames, loud noises, odors, or other distractions
- No personal information (name, school, grade, web address, phone number, etc.)
- No active internet connections

* Pictures are a great way to get around these banned items and still show the experiment setup. Be sure the pictures do NOT include faces.

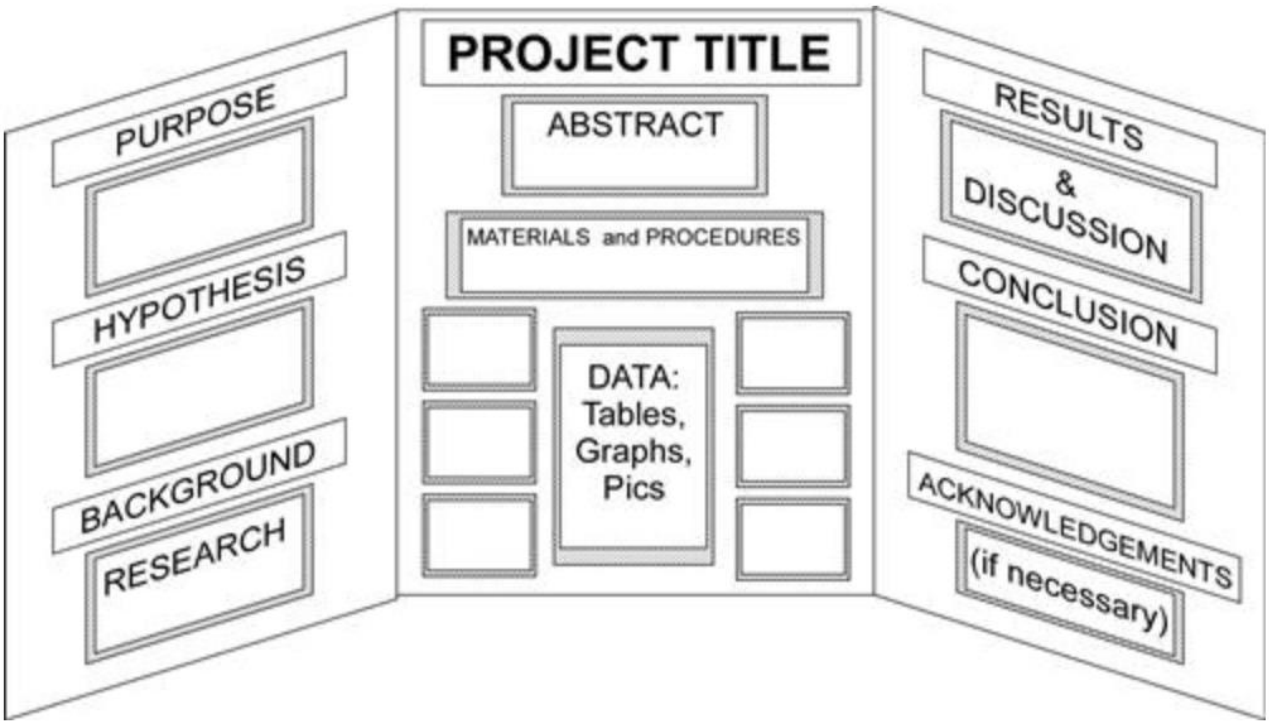
____ 15. Individuals may enter no more than 1 project

____ 16. No student or participant's faces/photos may appear on the projects

____ 17. Fair directors have final say on matters not covered in the fair rules, if you have a question ask

Displaying a Science Fair Project

Your display may include whatever objects that are not excluded by the rules. Your display should include title, question, hypothesis, report (optional for elementary), list of materials, procedure, observations, conclusions, and abstract



* Pictures are a great way to get around banned items and still show the experiment setup.

* Be sure pictures do NOT include faces.

Items you may want to include at the display:

- Abstract if not on the board (be sure there is no identifying information on this form)
- Photographs of the experiment along the way if not or in addition to what is already on the board
- Copy of students written report without identifying information (optional)

Bibliography:

Please remember to keep record of all sources you gathered 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

Magazine:

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:

MasterClass Staff, "How to Launch a Space Shuttle,"
https://www.masterclass.com/articles/how-to-launch-a-space-shuttle, August 30, 2021

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

Possible Elementary Project Categories:

1. Animal Science
2. Behavioral and Social Science
3. Chemistry
4. Earth and Environmental Science
5. Energy
6. Engineering
7. Mathematics
8. Physics and Astronomy
9. Plant Science
10. Technology

2023-2024 Elementary Science Fair Abstract Form

Required for ALL Elementary School Projects

Division: **Elementary** Category: _____

Title of Project: _____

Briefly complete the information below concerning your project.

1. Describe the purpose of your project. (What did you want to find out?)

_____

_____

_____

_____

_____

_____

_____

_____

2. Describe the procedure you used to test your hypothesis. (What exactly did you do?)

_____

_____

_____

_____

_____

_____

3. Explain the conclusion(s) you reached. (What did you find out from your experiment?)

_____

4. Write in the space below or attach a separate list of your sources of information in form of a bibliography.

2023-2024 Student Checklist Form 1A

Required for ALL Elementary School Projects

1. a. Student/Team Leader: _____ Grade: _____

   Email: _____

   b. Student Team Member: _____ Grade: _____

   c. Student Team Member: _____ Grade: _____

2. Title of Project: _____

3. School: _____ School Phone: _____

   School Address: _____

   _____

4. Adult Sponsor (teacher): _____

   Phone/Email: _____

5. Does this project need SRC/IRB/IACUC or other pre-approval? __ Yes __ No
   Did you use any of the discouraged ideas from page 5, if so check yes above.

6. Where will you conduct your experimentation? (Check all that apply)
   ___ Research Institution ___ School ___ Field ___ Home

   ___ Other _____

7. List name and address of all non-home and non-school work site(s):
   Name: _____

   Address: _____

   _____

   Phone: _____

   Email: _____

WV Science and Engineering Fair
Vertebrate and Human Research Form
Divisions: Elementary and Middle

Instructions: Complete 1 per project before experimentation and submit to WVDE.

Project Information			
Project Title			
Category			
County			
School			

Student Information			
Student 1 Name		Grade	
Student 2 Name		Grade	
Student 3 Name		Grade	

Project Information	
Common name and number of animals used.	
Briefly describe the research project.	

Signatures	
Vertebrate Animal Research	Human Research
• Animals will be treated kindly and cared for properly. Animals will be housed in a clean, ventilated, comfortable environment appropriate for the species. • A veterinarian has reviewed the research plan to ensure the safety of the student and animal.	• I have attached a copy of any surveys or questionnaires I will use in my project or other documents provided to human participants. • I have attached a copy of the consent forms that inform participants of the research and ask for voluntary participation in the research. • I have kept the original consent forms and will be able to provide the originals upon request at the fair.

Student 1 Signature		Date	
Student 2 Signature		Date	
Student 3 Signature		Date	

Teacher / Adult Sponsor Information

Teacher / Adult Sponsor Name			
Email		Phone	
Teacher / Adult Sponsor Signature		Date	

School Administrator Information

School Principal Name			
School PrincipalSignature		Date	

Medical Professional Information

To be completed BEFORE experimentation (humans, vertebrates). For vertebrate animal research, this form must be signed by a veterinarian. For human subject research, this form must be signed by a medical doctor.

As a medical professional, I attest that I have carefully studied the research plan. My signature indicates approval of the research plan before the student begins experimentation.

Medical Professional Signature			
Medical ProfessionalName			
Veterinarian		Medical Doctor	
Email		Phone	

WV Science and Engineering Fair
Elementary / Middle Human Informed Consent Form

Instructions: An informed consent/assent/permission form should be developed in consultation with the Adult Sponsor, Designated Supervisor, or Qualified Scientist. This form is used to provide information to the research participant (or parent/guardian) and to document written informed consent, minor assent, and/or parental permission. When written documentation is required, the student researcher keeps the original, signed form. If the form is serving to document parental permission, a copy of any survey or questionnaire must be attached.

Project Information

Project Title	
Student Researchers	
Category	
County	
School	

Please answer the questions below:

I am asking for your voluntary participation in my science fair project. Please read the following information about the project. If you would like to participate, please sign in the appropriate area below.

Purpose of the project:

If you participate, you will be asked to:

Time required for participation:

Potential Risks of Study:

Benefits:

How confidentiality will be maintained:

If you have any questions about this study, feel free to contact:

Adult Sponsor Name:		Email		Phone	

Voluntary Participation: Participation in this study is completely voluntary. If you decide not to participate there will not be negative consequences. Please be aware that if you decide to participate, you may stop participating at any time and you may decide not to answer any specific question. By signing this form, I am attesting that I have read and understand the information above and I freely give my consent/ assent to participate or permission for my child to participate.

Participant Name		Participant Signature		Date	
Parent Name (if the participant is a minor)		Parent Signature		Date	