

University Park Science Fair

Dear Parents and Guardians,

With the science fair just around the corner, it is time for fourth and fifth graders to begin thinking about a topic to explore. All 4th and 5th graders are expected to participate by producing an experimental project and this will be an optional project for 3rd graders. The attached sheets provide the guidelines and project ideas to help students get a start. Also, the local library is a great source for books and videos filled with project ideas ideal for our young scientists. Students are expected to have a completed science fair project here by **Tuesday, November 18th, 2014**. Oral presentations will take place in classrooms then and projects will receive a science grade. We will have judges visit University Park and talk one-on-one with our students about their projects on Thursday, November 20th, 2014..

There are many purposes why we ask students to participate in the U.Park Science Fair:

- Develop inquiry and investigation skills
- Stimulate an interest in science
- Increase knowledge of science
- Increase student, parent, and community participation in science education

As a result of participating in the science fair, student will use the following processes:

- | | |
|---------------------|----------------------|
| -Defining a problem | -Testing |
| -Inferring | -Observing |
| -Predicting | -Evaluating |
| -Collecting data | -Analyzing |
| -Hypothesizing | -Defining |
| -Recording | -Drawing conclusions |
| -Describing | -Measuring |

Parental assistance is essential for the success of this project. We encourage parents to advise, guide, suggest, plan, and remind students about the project. We hope parents will help by driving to the library, purchasing a few materials, and buying a display board. Display boards can be purchased at office supply stores, Michaels, Target, all for a reasonable price. Please do not use poster board. Projects should be able to stand on their own. If you have any questions, please feel free to contact your child's classroom teacher. Have fun and good luck!

Mrs. Durkee Ms. McMahon Mrs. Morton Ms. Bryers

Ms. Kull Ms. Kwan Mr. Varveris

Student Project Contract

Student Agreement

I, _____, agree to complete a science fair project on
_____ (Title of Project).

I also agree to do my own work and follow the guidelines for the University Park Science Fair projects.

I understand that my project must be completed by _____.

Student Signature: _____ Date: _____

Parent or Guardian Agreement

I agree to encourage my child's participation in the University Park Science Fair by providing guidance and support when needed. I will ensure that my child completes the project on or by the due date.

Parent or Guardian Signature: _____

Date: _____

Display Board Label

Please cut out the following label and glue this to the back of the display board of your project on the upper left hand corner.

Name: _____
Grade: _____
Teacher: _____
Title: _____

Abstract Form

Title of Project:	
Student Name:	
School and City:	
Abstract (250 words or less):	
As a part of this research project, student directly handled, manipulated, or interacted with (check all that apply):	
<input type="radio"/> human subjects	<input type="radio"/> non-human vertebrate animals
<input type="radio"/> pathogenic agents	<input type="radio"/> controlled substances
<input type="radio"/> recombinant DNA	<input type="radio"/> human/animal tissue
<i>Do not bring any of above materials to the Science Fair. Students are allowed to bring only tri-fold presentations.</i>	
Student independently performed all procedures as outlined in this abstract.	<input type="radio"/> Yes <input type="radio"/> No
This project was conducted at a Registered Research Institution.	<input type="radio"/> Yes <input type="radio"/> No
Is this project a continuation?	<input type="radio"/> Yes <input type="radio"/> No
Category:	
I hereby certify that the above statements are correct and the information provided in this Abstract is the result of one year's research. I also attest that the above property reflects my/our own work.	
Student Signature	Date

Kindergarten–Grade 5 Research Plan Instruction

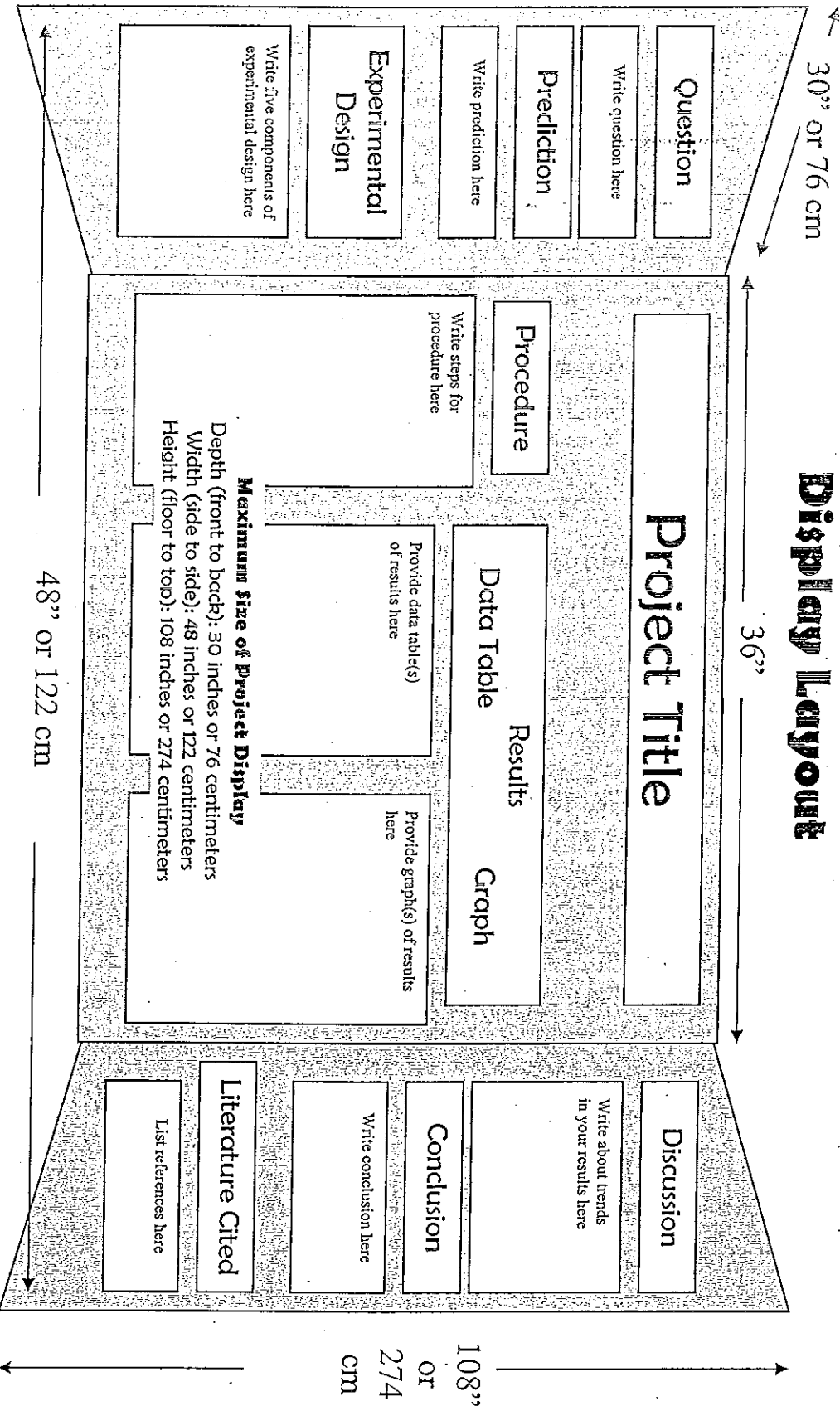
A complete typed or handwritten research plan is required and must be attached to your cover sheet.

Research plans for ALL projects must include the following.

Note: Vertebrate animal experimentation is discouraged.

- A. Question or Problem being addressed
- B. Prediction/Hypothesis/Engineering Goals
- C. Detailed Description of method or procedures: Important and key items below should be included when formulating *any and all* research plans.
 - **Procedures:** Detail all procedures and experimental design used for data collection.
 - **Data Analysis:** Describe procedures—claims and evidence—used to analyze data that answer research question or hypothesis.
- D. Bibliography: List at least two references (e.g., science journal articles, books, Internet sites) from your literature review.
 - Choose one style and use it consistently to reference literature used in research plan. See details in the *International Science and Engineering Fair Student Handbook* at <http://www.societyforscience.org/document.doc?id=12>.

Display Layout



Creating Your Science Fair Display

- Your display should be mounted on a display board that can sit on top of a table and stand up by itself.
- Your display must fit into a space 36 inches high and 48 inches wide.
- Your display should be easy to read, neat, and organized. Please see the sample display layout for suggested organization.
- Use color, photographs, drawings, graphs, tables, and charts to emphasize your findings and draw viewers' interest.
- Your display should include all the sections listed below.

Sections to include in your Science Fair Display

1. **Title is a statement describing an investigation.**
 - The title of your project should be a complete sentence.
 - The title should state how the independent variable and the dependent variable in your investigation are related.
Sample: "The Effect of the Changes in the independent variable on the dependent variable."
2. **Question describes the focus of the investigation.**
 - Your question should be testable.
 - Write your question so someone else can easily understand what you are asking.
3. **Prediction is a statement of the relationship of an independent and dependent variables to be tested in an investigation; it predicts the effect that the changes purposely made in the independent variable will have on the dependent variable.**
 - Your prediction should make a statement about what you think will happen.
 - Your prediction should relate the independent variable to the dependent variable.
4. **Experimental Design**
 - Using the five components below, describe the design of your investigation.
 - **Independent variable:** the variable that is changed on purpose by the experimenter
 - **Dependent variable:** the factor or variable that may change as a result of changes purposely made in the independent variable
 - **Constant variables:** factors in an investigation that are kept the same and not allowed to change or vary
 - **Control group:** the part of an experiment that serves as a standard of comparison; a control is used to detect the effects of factors that should be kept constant, but which vary; the control may be a "no treatment" group or an "experimenter selected" control
 - **Number of repeated trials:** the number of times that a level of the independent variable is tested in an investigation or the number of objects or organisms tested at each level of the independent variable
5. **Procedure**
 - List the steps you followed to complete your investigation.
 - Write the list of steps in the order you completed them.
 - Check the list carefully for accuracy.
 - If you are using part of a procedure from your text book or from the teacher, you may reference that procedure instead of re-writing it.
6. **Results**
 - Include at least one data table and one graph to represent your data. In addition, other representations of data may be used to show results.

Data Table

- Give your data table a title.
- Make a table containing vertical columns for the independent variable and dependent variable.
- Subdivide the column for the dependent variable to reflect the number of trials.

- Order the values of the independent variable, preferably from smallest to largest.
- Record values of the dependent variable.
- Calculate the average results of each trial and record the values.
- Use correct units of measurement.

Graph

- Give your graph a title.
- Draw and label the X and Y axes of the graph. Place the independent variable on the x-axis, and the dependent variable on the y-axis.
- Determine an appropriate scale for the x and y axes; subdivide the axes.
- Use correct units of measurement.
- Provide a legend.
- Decide the most appropriate form to plot the data (line, bar, or pie graph)
- Summarize data trends on the graph.

7. Discussion

- Write a paragraph summarizing the results in words.
- Write a second paragraph including the trends or patterns in your results.
- Write a third paragraph that describes the science knowledge that supports your results.

8. Conclusion

- Restate your question.
- State whether the prediction is supported by evidence.
- State your most important result.
- Give an explanation that relates your evidence to something you have learned about science.
- Provide suggestions for further investigations based on your results.

9. Literature Cited: *If you referenced any sources, such as books, articles, or Web sites, list them in this section with the title, author, year, and URL (if Web site).*

10. Oral Presentation

Effective communication of project including:

- Relating scientific concepts to project
- Describing design principle
- Explaining data analysis
- Discussing future studies

Scoring Rubric

Title	
3	The title clearly states both the independent and dependent variables and is written as a clear declarative statement.
2	The title is clearly connected to the investigation, but does not mention the dependent or independent variables.
1	The title is present but does not relate directly to the investigation.
0	Not attempted
Question	
3	The question that the investigation was designed to answer is well articulated and testable.
2	The question that the investigation was designed to answer is testable.
1	The question is present, but is not testable.
0	Not attempted
Prediction	
3	The prediction is clearly stated and shows a reasonable relationship between the independent variable on the dependent variable.
2	The prediction is stated but is not reasonable or only mentions one variable.
1	The prediction is present but does not show a relationship between the variables.
0	Not attempted
Experimental Design	
3	At least four of the five components of experimental design are clearly stated.
2	At least three of the five components of experimental design are clearly stated.
1	At least two of the five components of experimental design are clearly stated.
0	Not attempted or only one of the five components of experimental design is clearly stated.
Procedure	
3	A detailed, logical step-by-step procedure is listed.
2	A logical step-by-step procedure is listed, but some steps are missing or incomplete.
1	A logical step-by-step procedure is listed, but many steps are missing or incomplete.
0	Not attempted
Results	
3	Data table(s), graph(s), and other representations of data are accurate, easily understood, and complete including title, appropriate labels, appropriate placement of variables, and use of correct units of measurement.
2	Data table(s), graph(s), and other representations of data include most of the above components.
1	Data table(s), graph(s), and other representations of data include some of the above components.
0	Not attempted
Discussion	
3	Discussion includes at least three paragraphs that summarize the results in words, describe trends or patterns in the results, and relate the science knowledge that supports the results.
2	Most parts of discussion are complete and accurate.
1	Some parts of discussion are complete and accurate.
0	Not attempted
Conclusion	
3	Conclusion clearly restates the question and whether the prediction was supported with evidence; includes an explanation that effectively connects results to scientific knowledge; and also provides suggestions for further investigations.
2	Most parts of conclusion are complete and accurate.
1	Some parts of conclusion are complete and accurate.
0	Not attempted

Creativity	
3	Project is clearly the original creative work of the student researcher. Input into the project by adults is limited.
2	Project is mostly the original creative work of the student researcher.
1	There is evidence of some input from adults beyond encouragement and assistance in obtaining materials.
0	There is evidence of significant input from adults beyond encouragement and assistance in obtaining materials.
Display	
3	Display is easy to read and well-organized. Color, graphics, and other visual components add to the display.
2	Two out the three qualities listed above are present.
1	One out the three qualities listed above is present.
0	Display is difficult to read, poorly organized, and visual components, such as graphics or color, are missing or distracting.
Oral Presentation	
3	Effective communication of scientific concepts, design principles, data analysis, and further studies.
2	Two out of the four qualities listed above are present.
1	One out of the four qualities listed above is present.
0	Communication was not effective.
Project Notebook Completion (see Cover Sheet)	
3	All paperwork listed on Cover Sheet is submitted in project notebook.
2	Most paperwork listed on Cover Sheet is submitted in project notebook.
1	One to two forms listed on Cover Sheet are submitted in project notebook.
0	No paperwork listed on Cover Sheet is submitted in project notebook.