

# Thorntown Elementary School



## 2023 Science Fair Handbook

### Grades K - 6

Information provided by the employees of CREW Technical Services  
An Engineering and Information

Dear Student,

Thank you for your interest in the Thorntown Elementary Science Fair. This packet has been put together to help you create a fantastic science fair project and exhibit. Students in grades Kindergarten through sixth grade are encouraged to participate. Projects may be done individually or with a partner. A team of judges will be evaluating our projects this year as in the past.

If you are going to present a project, please return the information sheet to the office by Thursday, **March 9**. The Science Fair will be on Thursday, **March 16, 2023**. Projects are due in by 8:00 a.m. that morning. Judging will begin promptly at 8:30 a.m. All projects need be picked up by 3:00 p.m. on Friday, **March 17**.

Please remember to create a project that is an experiment and not a demonstration. If you have any questions, please feel free to contact me at school. We look forward to seeing all of your wonderful projects.

Sincerely,

Mrs. Lester

## **A Successful Science Fair Project**

Must Follow the Scientific Method and Contain:

1. Question
2. Hypothesis
3. Procedure (How you plan and do your experiment)
4. Results
5. Summary/Conclusion

*Stay away from projects that only demonstrate a topic!*

**An experiment is necessary!**

## **Science Fair Requirements for Grades K-2**

Please read carefully the requirements for students in grades K-2.

Display boards need to contain the following information:

1. Question
2. Hypothesis
3. Materials and procedures
4. Observations and results
5. Conclusion
6. Acknowledgements

Please refer to the handout for information about each of these items.

All information will be on the display board and in the notebook.

**No written report in a separate folder is required.**

## **Science Fair Requirements for Grades 3-6**

Please read carefully the requirements for students in grades 3-6.

Your project must include:

1. Visual display
2. Written Report
3. Project Notebook

Display board needs to contain the following information:

1. Question
2. Hypothesis
3. Materials and procedures
4. Observations and results
5. Abstract
6. Conclusion
7. Acknowledgements

Written Report and Project Notebook:

Please refer to the handout for information about each of these items.

## Sample of Science Fair Judging Form

### Science Fair Score Sheet

Judge(s) \_\_\_\_\_ Total Score \_\_\_\_\_ /52

Project Name \_\_\_\_\_

Student Name(s) \_\_\_\_\_

Grade(s)/Teacher(s) \_\_\_\_\_

Please use the following rubric for scoring projects:

4 = Excellent

3 = Acceptable

2 = Needs Improvement

1 = Poor/Not Evident

Scientific Method				
<b>Problem/Question</b> <ul style="list-style-type: none"> <li>Problem/Question is stated in a clear, concise language that leaves little doubt as to what is being tested.</li> </ul>	4	3	2	1
<b>Hypothesis</b> <ul style="list-style-type: none"> <li>Clearly states the hypothesis and gives reasons that support the prediction.</li> </ul>	4	3	2	1
<b>Procedure &amp; Materials</b> <ul style="list-style-type: none"> <li>Experiment could be easily repeated because student has provided precise, clear, easy to follow instructions.</li> <li>List of materials and unit amounts are given.</li> <li>Test conducted at least 3 times.</li> <li>Experiment tests one variable and contains a control group.</li> </ul>	4	3	2	1
<b>Scientific Data &amp; Analysis</b> <ul style="list-style-type: none"> <li>Data is organized into graphs, tables or charts.</li> <li>Graphs/tables/charts allow for easy interpretation of the data.</li> <li>Narrative stating observations is given.</li> </ul>	4	3	2	1
<b>Conclusion</b> <ul style="list-style-type: none"> <li>Conclusion is stated in clear, concise language and is supported by data.</li> </ul>	4	3	2	1
<b>Total Points</b>	_____ /20			

Presentation: Interview				
<b>Speaks knowledgeably about the project.</b> <ul style="list-style-type: none"> <li>Eagerly shares many details about the experiment with little or no prompting.</li> <li>Clear, concise, thoughtful responses to questions.</li> </ul>	4	3	2	1
<b>Demonstrates an understanding of the scientific method.</b> <ul style="list-style-type: none"> <li>Can explain each step of the scientific method as it relates to their experiment (question, hypothesis, procedure, data, conclusion).</li> <li>Shows clear understanding of the control group and variable.</li> </ul>	4	3	2	1
<b>Demonstrates an understanding of the science.</b> <ul style="list-style-type: none"> <li>Can explain the basic science relevant to the project.</li> <li>Can discuss interpretations and limitations of results and conclusions.</li> <li>Can explain importance of experiment (life application).</li> </ul>	4	3	2	1
<b>Total Points</b>	_____ /12			

<b>Visual Display</b>	
Visual Appeal <ul style="list-style-type: none"> <li>• Display catches the audience's attention.</li> <li>• It is neat and well organized.</li> </ul>	4    3    2    1
Completeness <ul style="list-style-type: none"> <li>• All steps of the scientific method are represented on the board (question, hypothesis, procedure, data, conclusion).</li> <li>• Presents steps of methods clearly and completely with headings.</li> <li>• Display board shows data in clear tables, charts or pictures with headings or captions.</li> </ul>	4    3    2    1
Language Usage <ul style="list-style-type: none"> <li>• No spelling, punctuation, or grammar errors on the board.</li> </ul>	4    3    2    1
<b>Total Points</b>	_____ /12

<b>Notebook and Written Report</b>	
Notebook: All Grades      Written Report: Grades 3-6	
Evidence of Scientific Method <ul style="list-style-type: none"> <li>• Information includes in detail, all steps of the scientific method, experimentation, data, research and analysis.</li> </ul>	4    3    2    1
Appearance <ul style="list-style-type: none"> <li>• Notebook shows information was recorded in detail by the student throughout the experiment.</li> <li>• Written report (grades 3-6) is easy to read because it is neat, organized, and contains little or no spelling, punctuation or grammar errors.</li> </ul>	4    3    2    1
<b>Total Points</b>	_____ /8

Two positive comments:

One positive suggestion:

## Scientific Method

- 1. Start with a question.**
- 2. Plan an experiment.**

Your experiment must test something, data must be measurable, and needs to be able to be done by someone else who should get similar results.
- 3. Test only one variable.**

Variables are the things that you change in an experiment.
- 4. Keep it simple.**
- 5. Have a control group!**

A control group is a way of proving that your results were not affected by other factors. For example if you are testing which fertilizer makes tomato plants grow faster, you should have one tomato plant that is not fertilized at all. This will show how fast a tomato plant grows without fertilizer. Also, if the tested plants die but the unfertilized plants do not, you could conclude that you over fertilized the test plants.
- 6. At least five objects in each group!**

In the experiment described in #5 you should have at least five tomato plants fertilized with each type of fertilizer and five in the control group. For you experiment to be statistically valid you should have at least five objects in each group. However, the more data you collect the more valid your results should be. Surveys should contain at least 50 subjects – more if possible.
- 7. If possible, test five times.**

Don't assume that the first results you get are accurate. If you can, do it over again, then again. For the tomato plant and fertilizer experiment you don't have to re-test, just make sure that you have at least five plants in each group and then test over many days! Thirty day would be a minimum amount of time for an experiment like this.
- 8. Control everything that you can!**

Perform you experiment exactly the same each time. Only teat one variable at a time (for example in the experiment described in #5 above you must change only the type of fertilizer that each plant receives. You should keep the amount water, sun and fertilizer EXACTLY the same for each tomato plant. The plants must be the same size, variety and type when you start and must be planted in the exact same container with the same type of soil. This will prove that it is the type of fertilizer that effected the difference in growth – nothing else).

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**9. Carefully collect your results and write down EVERYTHING you observe.**

Design your experiment so that your results can be measured. On our tomato plant experiment you can simply measure how tall each plant is each day and make a nice chart. At the end of the experiment take the results that you collected daily and think about how to best display all of them together. Would a bar graph work? How about a line graph?

Results and observations should all be recorded in your project notebook on a daily basis if the experiment takes a long time. Collect your data at the same time each day. Did you notice that some of your tomato plants turned sort of yellow? Record that in your project notebook! Was there a day that you forgot to water the plants? Write it down!

**10. Examine your results.**

When you complete your experiments, examine and organize your findings. Did your experiments give you the expected results? Why or why not? Was your experiment performed with the exact steps each time? Are there other explanations that you had not considered or observed? Were there errors? Remember that understanding errors and reporting what went wrong can be valuable information.

## The Project Notebook

Your project notebook is your most treasured piece of work! Accurate and detailed notes make for a logical and winning project. Good notes will only show your consistency and thoroughness to the judges, but will also help when you are writing your written report! It does not have to be neat! Write down everything in it in your own handwriting. If you spill something on it during the experiment - don't worry about it! It is a tool to assist you in the project and should look well used. (Don't make it messy on purpose though!) It should be a notebook and not a lot of loose papers. Index cards in a box will work also.



## The Written Report

Papers should be neatly bound (an attractive folder is nice) and this report should include:

### 1. Title Page

The title page should have the title of your project in the center of the page several inches from the top of the page. Your name, school and grade should be placed in the lower right-hand corner.

### 2. Abstract

The abstract is a shortened version of your entire paper. Others can read your abstract if they do not have time to read your whole paper. It should include information about yourself at the top: name, school, grade and age. Below this information write three short paragraphs: the Question, the Procedure and the Results.

*The Abstract should be included with your written report AND posted on your display!*

### 3. Question

The question asks what you are expected to discover by investigating the chosen topic.

### 4. Hypothesis

A hypothesis is an educated guess or current scientific opinion about what you think will occur as a result from conducting your experiment. (What do you think will happen? Do your research first!)

### 5. Materials and Procedure

List all materials and supplies you used in the project. Quantities and amounts of each should also be indicated. List and describe the steps you took to complete your experiment, numbering them in order.



*(Continued on next page)*



## **6. Observations and Results**

Tell what you learned from doing your experiment. What new information did you find out by asking this question, doing your research and watching what happened during your experiment? What do you now know that you didn't before? Show the results of your experiment with data – facts, numbers, etc. Include raw, smooth and analyzed data, in all forms including charts, graphs, tables, photographs, drawings and diagrams that you have either created by hand or on the computer or that you collected or found in other sources. Be sure that all results, in whatever format, are neat and legible. Accurately and clearly label and title EVERYTHING!

## **7. Conclusions**

This is a brief statement explaining why the project turned out the way it did. Why did the events you observed occur? Begin your conclusion by restating your hypothesis. Your results may concretely establish your theory to true or false. However, it is also possible that the results were inconclusive, which means that although there may be a trend in your data, it is not strong enough to prove or disprove your hypothesis.

## **8. Background Research and Bibliography**

Report your work and research conducted by others in the past that relates to your topic and facts that help you understand it. Then record the sources (books, encyclopedias, magazines, Internet sites, etc.) that you used in a bibliography.

## **9. Acknowledgments**

In one or two sentences, say "thank you" to those who helped you with your project (parents, grandparents, teachers, etc.) You should include those who gave you guidance, materials and the use of facilities or equipment.



# Science Fair Information Sheet

Please return this sheet to Mrs. Lester's mailbox by Thursday, **March 9**.

The Science Fair will be held on Thursday, **March 16, 2023**. Projects are due in by 8:15 a.m. that morning. Please pick up projects up by 3:00 p.m. on Friday, **March 17**.

Student name \_\_\_\_\_

Grade \_\_\_\_\_ Teacher \_\_\_\_\_

Title of Project \_\_\_\_\_

Brief Description of Project

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Is this a group project? Yes \_\_\_\_\_ No \_\_\_\_\_  
(No more than 2 students per group)

If yes, please list the name of the other student \_\_\_\_\_  
(Every participant must turn in a signed information sheet)

Parent/Guardian Signature \_\_\_\_\_