Science Fair Project

5th Grade

Due:

Gilliard Elementary School Science Fair Timeline 2024 – 2025

These dates are tentative. If a date changes, you will be informed in writing.

Tuesday, September 17, 2024	Parent letters go home.
Monday, September 23, 2024	Return Signed Student/Parent Sheet.
Tuesday, October 1, 2024	Folder Check: Project Topics, Purpose, and Problem (Question) sheet complete.
Monday, October 7, 2024	Folder Check: Research and Sources sheet complete.
Tuesday, October 15, 2024	Folder Check: Hypothesis sheet complete.
Monday, October 21, 2024	Folder Check: Materials List sheet complete.
Monday, October 28, 2024	Folder Check: Procedure and Data Table sheet complete; you should have gathered all materials at home.
Monday, November 4, 2024	Conduct experiment at home, record data, take pictures of experiment – 5 with you in the picture and 5 without you in the picture.
Tuesday, November 12, 2024	Experiment checkpoint parent letter
Monday, November 18, 2024	Folder Check: procedures, data collection, and pictures complete (This is a recheck of the Procedure and Data Table sheet to make sure you have collected your data).
Monday, December 2, 2024	Folder Check: rough draft of graph (hand drawn) with data table complete
Monday, December 9, 2024	Students will create computer graphs in the STEM Lab at school. Students must have their folder to complete this assignment.
Monday, December 16, 2024	Folder Check: Results paragraph sheet complete.
Monday, January 6, 2025	Tri-fold board pick-up for parents (8:30am – 4:30pm)
Tuesday, January 7, 2025	Tri-fold boards sent home with students who did not pick them on the
Monday, January 13, 2025	Folder Check: Conclusion sheet and Abstract sheet complete.
Tuesday, January 21 2025	Complete display boards due with complete Science Fair Folder (drop-off 8:30am – 4:30pm)
Friday, January 24, 2025	Gilliard's Science Fair

*Please contact Ms. A. Jackson with any questions/concerns regarding the project.

Email address: ajackson4@mcpss.com

School Number: 251-221-1820, please leave a message and I will return your call.

25 Science Fair Projects to Choose From

These projects were selected from www.sciencebuddies.org and www.education.com. Review these projects at the appropriate website. Please have your child choose one. If you have any questions, please contact the STEM Lab teacher, Ms. A. Jackson.

Botany

1. Suck It Up: Capillary Action of Plants http://www.sciencebuddies.org/science-fair-projects/project ideas/Plant Bio p033.shtml#summary

2. Can Aloe Juice Save Your Berries from Mold? http://www.sciencebuddies.org/science-fair-projects/project ideas/MicroBio p033.shtml

3. Growing, Growing, Gone! http://www.sciencebuddies.org/science-fair-projects/project ideas/PlantBio p012.shtml

4. Does Aspirin Help Plants Grow? http://www.education.com/science-fair/article/dissolved-aspirin-grow-plants-faster/

5. Does the Color of Light Affect Plant Growth? http://www.education.com/science-fair/article/color-light-affect-plant-growth/

Earth and Space Science

1. Porosity and Particle Size http://www.sciencebuddies.org/science-fair-projects/project ideas/Geo p012.shtml

2. Soil Compaction http://www.sciencebuddies.org/science-fair-projects/project ideas/Geo p010.shtml

3. How Salty is the Sea? http://www.sciencebuddies.org/science-fair-projects/project ideas/OceanSci p009.shtml

4. Polar Puzzle: Will Ice Melting at the North or South Poles Cause Sea Levels to Rise? http://www.sciencebuddies.org/science-fair-projects/project ideas/OceanSci p015.shtml#summary

5. Soil Color and Moisture http://www.sciencebuddies.org/science-fair-projects/project ideas/Geo p011.shtml#summary

Engineering

1. Can the Color of Your House Reduce Your Energy Footprint?
http://www.sciencebuddies.org/science-fair-
projects/project ideas/EnvEng_p012.shtml#background
2. Rubbing Up Against Static Electricity http://www.sciencebuddies.org/science-fair-
projects/project ideas/Elec p017.shtml#background
3. Are Laminates Stronger? http://www.sciencebuddies.org/science-fair-
projects/project ideas/MatlSci p008.shtml#summary
4. Crank Up the Music! http://www.sciencebuddies.org/science-fair-
projects/project ideas/Energy p008.shtml#summary
5. Wave Blockers http://www.sciencebuddies.org/science-fair-
projects/project ideas/MatlSci p036.shtml

Physical Science

1. A Day in the Life of Your Heart http://www.sciencebuddies.org/science-fair-
projects/project ideas/Hum Bio p014.shtml
2. A Battery that Makes Sense http://www.science buddies.org/science-fair-
projects/project ideas/Energy_p015.shtml#summary
3. Swing Low: Investigate the Motion of a Pendulum
http://www.sciencebuddies.org/science-fair-
projects/project ideas/Phys_p016.shtml#summary
4. How Far Will It Fly? Build and Test Paper Planes with Different Drag
http://www.sciencebuddies.org/science-fair-projects/project
5. Skipping Science: An Experiment in Jump Rope Lengths
ideas/Aero p046.shtml
http://www.sciencebuddies.org/science-fair-projects/project ideas/Sports p051.shtml

Environmental Science

1. Air Particles and Air Quality http://www.sciencebuddies.org/science-fair-projects/project ideas/EnvSci p009.shtml
2. The Big Dig http://www.sciencebuddies.org/science-fair-projects/project ideas/EnvSci p010.shtml
3. Greenhouse Project http://www.education.com/science-fair/article/greenhouse-project/
4. Energy Efficient Windows http://www.education.com/science-fair/article/energy-efficient-windows/
5. Compost Ingredients http://www.education.com/science-fair/article/what-makes-best-compost-pile/

Due: Tuesday, October 1, 2024

Project Topic, Purpose, and Problem (Question) Sheet

I have chosen the following project from the *25 Science Fair Projects to Choose From* list:

I will be measuring _____

PROCEDURE SUMMARY: Write a brief summary of what you plan to do and what and how you plan to measure the results. Will be approved with teacher signature.

PURPOSE: The purpose of the project tells what you are testing- One Sentence Here. The next sentence(s) tell why this would be of interest to someone. It is written as a paragraph with a main idea and two or three detail sentences that support the main idea.

PROBLEM/QUESTION: The question is what you are trying to find out through your investigation. What are you testing? What do you want to find out? It must be a question that can be answered by experimentation, running at least 5 trials using the same materials and done the same way. It should not be a question that is answered with a 'yes' or 'no.' Write your question below.

Parent Signature _____ Date _____

Student Signature _____ Date _____

Doing the Research and Forming a Hypothesis

So you've picked your category and you've chosen a topic. You even wrote a question using our cool fill in the blank template. Now it is time to research your problem as much as possible. Becoming an expert at your topic is what real scientists do in real labs.

So how do you become an expert?

YOU READ!!!!

READ about your topic. READ encyclopedias. READ magazine articles and books from the library. READ articles from the internet. Take note of any new science words you learn and use them. It makes you sound more like a real scientist. Keep Track of all the books and articles you read. You'll need that list for later.

YOU DISCUSS!!

Talk about it with your parents. Talk about it with your teachers. Talk about it with experts like Veterinarians, Doctors, Weathermen or others who work with the things you are studying. Sometimes websites will give you e-mail addresses to experts who can answer questions.... *But again, do not write to anyone on the internet without letting an adult supervise* it. (*hint: take pictures of yourself interviewing people)

Whew.....

Then when you think that you can't possibly learn anymore and the information just keeps repeating itself. You are ready to...

Write a Hypothesis

Now it is the time to PREDICT what you think will happen if you test your problem. This type of "SMART GUESS" or PREDICTION is what real scientists call A HYPOTHESIS. Using this fancy word will amaze your friends and will have you thinking like a full-fledged scientist.

So how do you begin? Well, just answer this very simple question:

What do you think will happen, (even before you start your experiment)?

Example Problem: Which *Paper Towel* is *more absorbent?*

Example Hypothesis: *I think Brand X* will *be more absorbent because* it's a *more popular brand,* it *is* thicker *and the people* I interviewed *said that the more expensive brands would work* better

(This hypothesis not only predicts what will happen in the experiment, but also shows that the "Scientist" used research to back up his prediction.)

Due Tuesday, October 15, 2024

Hypothesis Sheet

HYPOTHESIS: A hypothesis is your predicted answer to your purpose question. It is written as an IF..., THEN... statement. "IF I do this, THEN this will happen." You are making a prediction of what you think the results of your experimentation will be when you do a certain thing or under a certain circumstance. You will then add one sentence or more that tells why you think this will happen. This is just a prediction. It may or may not be your result.

If _____
_____
_____

then _____
_____
_____

The reason **for** this
is _____
_____
_____

Parent Signature _____ Date _____

Student Signature _____ Date _____

Due Monday, October 21, 2024

Materials List

List all your MATERIALS here:

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

Parent Signature _____ Date _____

Student Signature _____ Date _____

Testing your Hypothesis by doing an experiment

Now **we've** come to the good part. The part that all scientists can't wait to get their grubby little hands on**...** you guessed it... The EXPERIMENT!

Designing an experiment is really cool because **you** get to use your imagination to come up with a test for your problem, and most of all, **you** get to prove (or disprove) your Hypothesis. **Now Science Fair Rules state that you cannot perform your experiment live, so you'll have to take plenty of pictures as you go through these seven very simple steps.**

First: *Gather* up your *materials***.** What will you need to perform your experiment? The safest way to do this is get that adult **you** recruited **to** help you get the stuff **you need**. **Oh**, did we mention to take pictures or draw pictures of your materials. This will come in handy when you are making your board display.

Second: ***Write* a** *PROCEDURE.* A **procedure** is a list of steps that you did to perform an experiment. Why do **you** need to write it down**?** Well it's like giving someone a recipe to your favorite dish. If **they** want to try it, they can follow your steps to test if its true. Scientists do this so that people will believe that they did the experiment and also to let other people test what they found out. Did we mention to take pictures of yourself doing the steps**?**

Third: ***Identify*** *your* variables**.** The variables are any factors that can change in an experiment. Remember that when you are testing your experiment you should only test one variable at a time in order to get accurate results. In other words, if you want to test the affect that water has on plant growth, then all the plants you test should be in the same conditions, these are called controlled variables: same type of dirt, same type of plant, same type of location, same amount of sunlight, etc. The only variable you would change from plant to plant would be the amount of water it received. This is called the independent or manipulated variable. The independent variable is the factor you are testing. The results of the test that you do are called the dependent or responding variables. The responding variable is what happens as a result of your test. Knowing what your variables are is very important because if you don't know them you won't be able to collect your data or read your results.

Fourth: **TEST, TEST, *TEST.*** Remember that the judges expect your results to be consistent in order to **be a** good experiment**,** in other words, when you cook from a recipe you expect the outcomes to be the same if you followed the directions **(**or procedure) step by step. So that means you need to do the experiment more than once in order to test it properly. We recommend five times or more. More is better! Don't forget to take pictures of the science project being done and the results.

Fifth: ***Collect*** *your DATA.* This means write down or record the results of the experiment every time **you** test it. Be sure You also need to organize it in a way that it is easy to read **the** results. Most scientists use tables, graphs and other organizers to show their results. Organizing makes the results easy to read, and much easier to recognize patterns that might be occurring in your results**.** (Besides, it impresses the judges when you use them.) But don't make a graph or table because we asked you to, use it to benefit **your** project and to help you make sense of the results. There is nothing worse than having graphs and tables that have nothing to do with answering **the** question of a science project.

Due: Monday, October 28, 2024

Procedures and Data Sheet

PROCEDURES: List the procedures (steps) you will follow IN ORDER when conducting your experiment. The steps are to be numbered in the order they take place. Each sentence is an imperative sentence that gives a command. Start each step with a verb.

_____
_____
_____
_____
_____
_____
_____
_____
_____

DATA TABLE: Draw your data table here. Make sure to label your columns and rows. You will use this to collect your data when you conduct your experiment.

Parent signature _____ Date _____

Student signature _____ Date _____

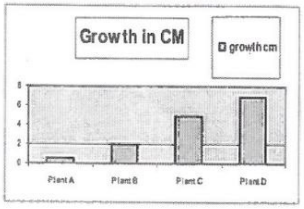
Time out: How Do You **Collect** Data**?!!?**

- **Keep a science journal:** A science journal is a type of science diary that you can keep especially if your experiment is taking place over a long period of time. We suggest you do that if your experiment is over a period of a week or more. In your journal you can record observations, collect re- search, draw and diagram pictures and jot down any additional questions you might have for later.
- **Have the right tools to do the job:** make sure you have the stuff you need to take accurate measurements like rulers, meter tapes, thermometers, graduated cylinders or measuring cups that measure volume. The recommended standard of measurement in science is metric so if you can keep your measurements in meters, liters, Celsius, grams, etc, you are doing great!
- **Tables, charts and diagrams** are generally the way a good scientist like you would keep track of your experiment trials. Remember you are testing at least 5 times or more. A table is organized in columns and rows and ALWAYS has labels or headings telling what the columns or rows mean. You will probably need a row for every time you did the experiment and a column telling what the independent variable was (what you tested) and the responding variable (the result that happened because of the independent variable)

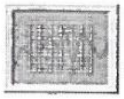
Plant	Amount of water per day	Size it grew in two weeks
(controlled variable)	(independent variable)	(responding variable)
Plant A	none	.5 cm
Plant B	5 ml	2 cm
Plant C	10 ml	5 cm
Plant D	20 ml	7 cm

- **Be accurate and neat!** When you are writing your tables and charts please make sure that you record your data in the correct column or row, that you write neatly, and most of all that you record your data as soon as you collect it **SO YOU DON'T FORGET WHAT HAPPENED!!!! Sometimes** an experiment might be hard to explain with just a table, so if you have to draw and label a diagram (or picture) to explain what happened, it is recommended that you do.
- **Use the right graph for your experiment**. There is nothing worse than a bad graph. There are all types of graph designs, but these seem to be easy to use for science fair experiments.

  - **Pie graphs** are good to use if you **are** showing percentages of groups. Remember that you can't have more than 100% and all the pieces need to add up to 100%. This type of graph is great if you are doing surveys
  - **Bar graphs** are good to use if you are comparing amounts of things because the bars show those amounts in an easy to read way. This way the judges will be able to tell your results at a glance. Usually the bars go up and down. The x axis (or horizontal axis) is where you label what is being measured, (like plant A, B, C and D) and the y axis (or vertical axis) is labeled to show the unit being measured (in this case it would be centimeters that the plant grew)



- **Line graphs** are good to use if you are showing how changes occurred in your experiments over time. In this particular case you would be using the x axis to show the time increments (minutes, hours, days, weeks, months) and then you would use the Y axis to show what you were measuring at that point in time.



....And Now back to the Experiment Steps

Sixth: Write a Conclusion*:* tell us what happened. Was your hypothesis right or wrong or neither? Were you successful, did it turn out okay? Would you change anything about the experiment or are you curious about something else now that you've completed your experiment. And most of all, **TELL WHAT YOU LEARNED FROM DOING THIS**.

Seventh: *Understand* its *Application.* Write about how this experiment can be used in a real life situation. Why was it important to know about it?

The Scientific Method

1. Choose a problem. (QUESTION**)**

- Choose something that interests you.
- Choose something that you don't know the answer to.
- Choose something you can work with.

2. Research your problem.

- Look in books.
- Get advice.
- Make observation.
- Build your understanding of the topic you have a question about.

3. Develop your HYPOTHESIS (what you think is the answer to your question)

- Use the words **if** and **then**. **"If I do this, then this will happen."**
- Form your HYPOTHESIS using your QUESTION.
- Your HYPOTHESIS must be something you can find out from your test.

4. List the MATERIALS you will need to complete your project.

- Be specific about what you used
- Tell how long something is or how much you use if that is important.
- Name everything you must have to do the project again if you needed to.

5. Write your PROCEDURES. (Tell what you will do to test your HYPOTHESIS)

- List each thing you will do. Number each step in order. Write down *everything* you will do. Others should be able to repeat your experiment by reading your PROCEDURES.
- Be sure you are testing your HYPOTHESIS. (Is there anything you haven't considered that could affect your experiment?)
- Control your variables. (A variable is anything that can change or vary during an experiment. In an experiment everything should be the same each time you test, except the one variable you are testing.)

6. Conduct your investigation.

- Get your materials.
- Follow your PROCEDURE.
- Make observations**.**
- Take photographs to show MATERIALS, and PROCEDURES. Be sure your face is not in the photographs**.**
- Record results in DATA TABLE.
- Be honest about the outcome.

7. Organize your DATA

- Make a GRAPH showing your DATA.
- Write a summary of DATA in RESULTS.

8. State your CONCLUSION.

- Look at your DATA.
- Decide what your DATA tells you about your HYPOTHESIS
- Tell whether your HYPOTHESIS was CORRECT or INCORRECT and why.
- Think about how you might change your experiment if you were to do it again or what else might you want to find out.

Things to Remember for the Science Fair Project

1. The project is to be on a tri-fold presentation board. One will be supplied by the school.

2. Your project must have a "catchy" title.

3. Refer to the sheet that shows how to arrange items on your board. Lay everything out before gluing. Rubber cement is a good choice for an adhesive. **DO NOT STAPLE!**

4. All sections that are displayed on the board must be typed in a font large enough to be seen from a distance of 4 feet away. Do not handwrite any part of the display. Do not use fancy, cursive fonts. They are too difficult to read.

5. The sections must include

a. Purpose

b. Question

c. Hypothesis

d. Abstract

e. Materials

f. Procedure

g. Data Table

h. Graph

i. Results

j. Conclusion

6. Take lots of pictures. You will be required to have 5 pictures without you in the photo and 5 pictures with you in the photo. However, do not show your face in the photo. Pictures may be placed around your board and/or organized in one place. The picture may have a label to explain.

7. Do not provide a model for your display board. That is the purpose of the pictures. Show your materials and some parts of your procedure in your pictures.

8. Everything attached to your board, even photos, should be backed by construction paper to add "pop" and interest to your board. Judges like to see that.

Due Monday, October 7, 2024

Research and Sources Sheet

Research: My problem is about this subject**:** _____

Books I found in the library on my topic are:

Title	Author
_____	_____
_____	_____
_____	_____
_____	_____

Internet sites that I found on my topic are:

_____
_____
_____
_____

Some important things that I learned about my topic are

- _____
- _____
- _____
- _____
- _____

Parent Signature _____ Date _____

Student Signature _____ Date _____

Date Monday, December 2, 2024

Graph Sheet

GRAPH: Hand-draw your graph on this sheet. Make sure to label the graph, axes, and data points.

Parent signature _____ Date _____

Student signature _____ Date _____

Date Monday, December 16, 2024

Results Sheet

RESULTS: Tell the results from your data table in paragraph form. This is where you tell the numbers in your DATA TABLE in complete sentences. You DO NOT make any judgements or conclusions here. You simply tell about what you measured.

Parent signature _____ Date _____

Student signature _____ Date _____

Date Monday, January 13, 2025

ABSTRACT

After answering the questions in complete sentences on this sheet, complete the ABSTRACT by writing all of the answers in paragraph form on notebook paper after this form. Answers to questions 1-3 make paragraph 1. The answer to question 4 is the second paragraph. Answers 5 and 6 are the final paragraph. It should be no more than 250 words and fit on one sheet of paper.

1. What did you investigate (PURPOSE)? _____

_____

_____

_____

2. Why would this interest anyone? _____

_____

_____

_____

3. What was your HYPOTHESIS? Tell why you thought this. _____

_____

_____

_____

4. How did you test your hypothesis (PROCEDURE summary)? _____

_____

_____

_____

5. What were your RESULTS? _____

_____

_____

6. Did your RESULTS agree with your HYPOTHESIS? _____

_____

Parent Signature _____ Date _____

Student Signature _____ Date _____

Date Monday, January 13, 2025

Conclusion Sheet

CONCLUSION: This paragraph tells whether your hypothesis was correct or incorrect and why. It tells what you found out. For example: "My hypothesis was incorrect. It was thought that the store brand paper towel would be more absorbent, but the tests proved that Home Decorator Towels were more absorbent."

Parent Signature _____ Date _____

Student Signature _____ Date _____

Notebook Paper

Parent Signature _____ Date _____

Student Signature _____ Date _____

Only use the titles that are listed on this sheet. You have more titles than required. Your name SHOULD NOT be anywhere on the front of the display. Your name and homeroom teacher's name SHOULD be on the back of the display.