

Martin County Elementary STEM Fair Handbook
Grades K-5



MARTIN COUNTY
SCHOOL DISTRICT

M|C|S|D

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Martin County Elementary STEM Fair

The Martin County Elementary STEM fair is an academic competition for public, charter, private and homeschools in Martin County grades K - 5. While teachers or schools may require their students to conduct an investigation, participation in the district competition is a voluntary decision made by the student.

This information packet contains all the information you will need to successfully complete your STEM investigation. Dates, forms, rules & guidelines, hints and other useful information are included in this handbook.

If you are unable to find the information you need in this packet, please contact Brook Bullock, Martin County Elementary STEM Fair Coordinator at bullocb@martin.k12.fl.us or 772-219-1887 ext. 201.

Important Dates

January 19 & 21, 2021
Student/Parent Information Meeting
Via Zoom with Mrs. Bullock at 6pm.

Invite Link for January 19, 2021

<https://martinschools-org.zoom.us/j/88654322065?pwd=Z1BxWXlmeVBuaXdsSWt3WCtvdFZ0dz09>

Invite Link for January 21, 2021

<https://martinschools-org.zoom.us/j/82016074419?pwd=SGJ1ZmtnRG02WUpZSDM2R2plWXYIYdz09>

April 23, 2021

Project due date for each school.
Projects may also be delivered to the
Environmental Studies Center by 3 pm on April 23, 2021.

***There will be NO EXCEPTIONS to the final drop off date.**

***Students need to register their project online prior to drop off.**

Click [HERE](#) to Register

April 26, 2021

Boards will delivered to the Environmental Studies Center.

April 28, 2021

Projects are judged.

Contact Form

Please fill out this form and attach it to the back of the project board.

Please print neatly.

School: _____

Student(s) Name: _____

Grade: _____

Contact: (telephone) _____ (email) _____

Project Title: _____

Category: (circle one)

Biology, Physical Science, Earth & Space,
Environmental, Product Testing, Health & Medicine,
Engineering/Invention, Math

Testable Question:

Method of Measurement: (metric if possible)

The Rules for All Projects



1. Investigation/Project categories: Biology, Earth & Space, Environmental, Health & Medicine, Physical Science, Product Testing, Engineering/Invention and Math
2. The following are **NOT** allowed; no exceptions: Live VERTEBRATE animals (invertebrate animals need to be approved by the County Coordinator), microorganisms (bacteria, viruses, fungi: yeast, mold, mushrooms, etc.). No alcohol, fire, hazardous chemicals or firearms (including Nerf-style guns) regardless of parental supervision.
3. Must be the student's work.
4. Project must be displayed on a presentation board. Please do not use headers (a large additional piece that attaches to the top of the board).
5. Must have a student log book written in **ink**. The log book must be with the board. **The log book does not have to be a notebook or composition book. It can be pages stapled together.** Place the log book in an envelope and firmly attach the envelope to the board (duct tape is suggested).
6. Contact form must be filled out NEATLY and glued to the back of the board.
7. Boards should be neat, with correct spelling and grammar. Presentation is important but this is not an art project. Boards will be judged for their content. Handwritten is fine.

8. Photos may be included and are encouraged but *do not* make the student's face fully visible where they can be identified.
9. If this is a class assignment there may be a timeline.
10. Measure and record data in **metric units** if possible.
11. Experiments must be repeated a minimum of **three** times.
12. Pets and humans are not to be used.
13. There will be no team or partner projects this year due to Covid.

The Elementary District Fair Committee reserves the right to disqualify any project from judging that does not comply with the above rules or is considered unsafe or inappropriate.

Guides for Successfully Completing a Project



Scientific Investigation

In a scientific investigation you ask a question, construct a hypothesis, test your hypothesis by conducting an experiment and draw a conclusion from the data collected.

A science investigation includes and follows these procedures:

1. Decide on a project: This is your testable question or problem you want to investigate. There are books in the Media Center with ideas and you can find projects on-line. There is a list of online websites on page 18.
2. Start your log book, NOW! Do not try and create your log book after conducting your experiment. Everything related to your experiment should be in your log book, written in ink. A composition book is preferred but not mandatory.
3. Conduct research: Example: Let's say you're doing a project on which type of soil will grow sunflowers the best, potting soil or sand. You will need to do some research on the types of soils. You will need at least **three** different sources for research. Books, online sources, magazines and even personal interviews are all good sources. Label a page in your log book **Research** and write a brief

summary of what you learned. Research will only be in your log book, not on the board.

HINT! Write down where you learned your information, for your bibliography (website, books, etc.) throughout your investigation. It is difficult to go back and find your sources when you are writing your bibliography.

4. Write your hypothesis; what you think the answer to your question will be. Use the words **IF**, **Then** and **Because**. Example: **IF** sunflower seeds are planted in potting soil and sand, **THEN** the seeds planted in potting soil will grow best, **BECAUSE** the soil will provide more nutrients and hold more water than the sand. Notice there are no personal words such as *I think* or *we predict*.

5. Procedure: Write your procedure, step by step on how to conduct your experiment. It should be similar to a cooking recipe. Another scientist should be able to reproduce your experiment exactly.

6. Materials: Gather the materials you will need.

HINT! List the materials NOW in your log book.

7. Define Variables and Control Group:

- **Independent Variable-** This is the variable that you are changing on purpose in your experiment to observe what will happen. Example: soil and sand.
- **Dependent Variable-** The outcome or result of your experiment. Example: Soil had the best results for the sunflower seeds.
- **Constant Variables-** These are variables in your experiment that do not change. There may be many. Example, same amount of soil, watered the same amount daily and so on.
- **Control Group-** A control group is the group that does not receive the control variable. Example: sunflower seeds that are not planted in any type of soil.

8. Experiment (test hypothesis): **CONDUCT AT LEAST 3 TRIALS!**
 - Gather all of your materials
 - Follow your procedure exactly.
 - Observe and record results in your log book (create a page for collecting data), in metric units. Centimeters (cm), grams (g), degrees Celsius (°C).
 - Take photos if possible. Remember, no fully visible faces.
 - REPEAT AT LEAST TWO MORE TIMES.
 - Be honest in your findings; they may not be what your expected and that's OK-It's Science!
9. Conclusion: What happened? What were your results? When you have your results you will need to report them. Use charts, graphs and a written summary of your results. These will be displayed on your board. Did your experiment prove your hypothesis correct or incorrect? In your conclusion, can you state a "Real World Value" to your investigation? Why it is important?
10. Create your board, the FUN part: The good news is, everything that goes on your board is already recorded in your log book. Type or neatly print your information. A sample of what information goes on the board is on page 18. There are no hard rules on how you display the information but make it logical for someone reading your board to understand. Remember this is not an art contest; content counts!

The following should be on your board:

- Title
- Question or Problem
- Hypothesis
- Materials
- Procedure
- Variables
- Data
- Chart or Graph
- Drawings & Photographs Conclusion & Real World Connections



Scientific Investigation Log Book

A log book is mandatory for all projects. Do your log book as you conduct your investigation. Place the log book in an envelope and firmly attach the envelope to the board (duct tape is suggested).

The following is a list of what should be in a log book:

- I. Table of Contents
- II. Title
- III. Purpose or Problem
- IV. Research
- V. Hypothesis
- VI. Materials
- VII. Procedure
- VIII. Variables
- IX. Data
- X. Graph or Chart of your data
- XI. Conclusion
- XII. Bibliography, minimum 3 sources, Wikipedia is not a source.

Engineering/Invention Projects

An Engineering or Invention project uses design and engineering to find a practical solution to a real problem. It is not a “kit” that is purchased in a store or instructions that are found in a book. Sometimes it is an improvement to an object that already exists. It does not have to be a product or object. It may be a new process for doing something. This type of project must serve a purpose.

An Engineering/Invention project should include the following:

1. Problem or Question – A description of the need or problem to be solved.
2. Research and Planning – A successful engineering project must have a plan. Think of each step from beginning to end. Ask yourself questions such as:
 - What can I read to help me with my project?
 - What materials will I need?
 - What will be my procedure?
 - How can I test my invention?
 - How will I track my data/results?
3. Developing and testing. Follow your plan step-by-step. Repeat the testing of your project/invention at least three times. You may need to change your plan as you go to make your project/invention work. This is ok! Record everything in your log book!
4. Reach a conclusion – A conclusion will be based on the data collected from your testing. Did your engineering project/invention solve the problem? Do you have ideas for further applications?

5. Create your board. Your board will be very similar to a Science Investigation board.

The following should be on the board:

- Title/Name of Invention
- Description of the problem it solves
- Description of how it works
- Materials
- Procedure for building
- Procedure for testing, at least three tests
- Data from testing
- Drawings & photographs
- Conclusion & Real World Connections

Engineering/Invention Project Log Book

A log book is mandatory for all projects. Do your log book as you conduct your investigation. Place the log book in an envelope and firmly attach the envelope to the board (duct tape is suggested).

The following is a list of what should be in a log book:

- I. Table of Contents
- II. Title/Name of Invention
- III. Purpose of Invention and Problem it solves.
- IV. Research
- V. Materials
- VI. Procedure
- VII. A description of the problems encountered and include drawings or photographs of attempts that failed
- VIII. Data
- IX. Graph or Chart of your data
- X. Conclusion
- XI. Bibliography, minimum 3 sources, Wikipedia is not a source.

Math Projects

Math Projects investigate a problem and gather data which is then analyzed mathematically. The focus is on math skills and processes used to explain the investigation results. Consumer–product surveys are good examples of math projects. Consumers are polled about their likes and dislikes. The data gathered is analyzed mathematically and the results of the survey are explained.

A Math project should include the following:

1. Problem or question – A description of the need or problem to be solved.
2. Research – at least three sources
3. Materials
4. Procedure for solving the problem
5. Testing
6. Data gathered
7. Graphs and charts if appropriate
8. Conclusion

Create a Board that explains your project. Your board will be very similar to a Science Investigation board.

The following should be on the board:

- Title
- Description of the problem it solves
- Description of how it works
- Materials
- Procedure
- Testing, at least three trials
- Data from testing
- Drawings & photographs
- Conclusion & real world connections

Math Project Log Book

A log book is mandatory for all projects. Do your log book as you conduct your investigation. Place the log book in an envelope and firmly attach the envelope to the board (duct tape is suggested).

The following is a list of what should be in a log book:

- I. Table of Contents
- II. Title
- III. Purpose of Project
- IV. Research
- V. Materials
- VI. Procedure
- VII. Data
- VIII. Graph or Chart of your data
- IX. Conclusion
- X. Bibliography, minimum 3 sources, Wikipedia is not a source.

How to Write a Bibliography

Examples:

Book:

Carratello, John, All About Science Fairs,
Huntington Beach, CA Teacher Created
Materials, Inc., 1989, pages 15-18.

Computer Software:

A Field Trip to the Earth, 2019, Pleasantville, NY: sunburst
Communications.

Internet:

G.F.M.S. Student Research Center Journal of Investigation Abstracts,
(2019), <http://k12s.phast.umass.edu/~jkenney/abstracts.html>

Interview:

Famous Scientist, Engineer/NASA, November 5, 2019.

Magazine Article:

Dohrmann, Pam, "Planting the Seeds of Science", Instruction, New
York City, NY, Scholastic Inc. March 2018, pages 26-29.

[How to Make a Bibliography - A Handy Guideline](#)

Websites That May Be Helpful for Projects

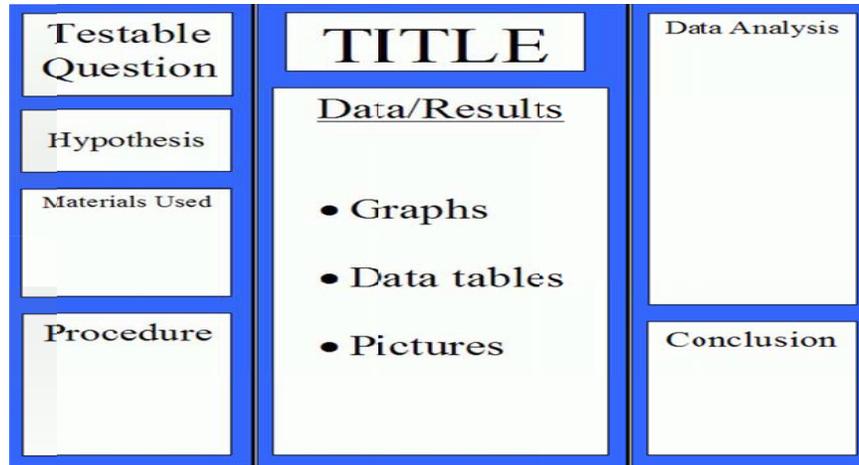
[Science Bob Science Fair](#)

[Science Buddies](#)

[All Science Fair Projects](#)

[How stuff works](#)

Sample Board Layout



This is a basic idea of what will be displayed on your board. Not every board will be the same.

The following **should** be on your board: Title, question or purpose, hypothesis, materials, procedure, variables, data and graph or chart, results.

Optional are photographs, data analysis and real world application or future tests.

Research and bibliographies **are not** displayed on the board.

Engineering/Invention and Math projects will vary some. Refer to the instructions for each of these categories.