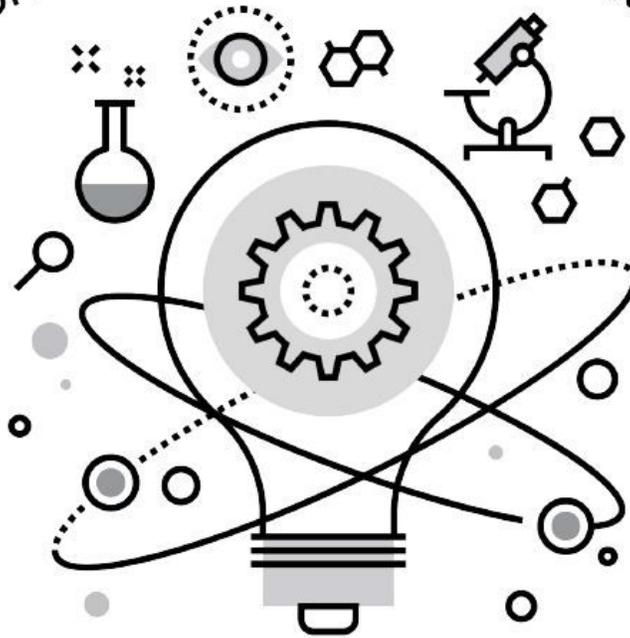


FREEDOM ELEMENTARY SCHOOL PTA PRESENTS:



17<sup>TH</sup> ANNUAL

**STEM FAIR**

**Handbook**

Dear Freedom Elementary School Parents,

The knowledge, skills, and abilities students gain from completing a STEM fair project will help prepare them for their future, especially in science, technology, engineering and mathematics fields.

STEM Fairs are one of the best opportunities for students to explore and share their ideas about how the world works. Through active inquiry, students ask questions, make predictions, test their ideas, and communicate their findings. This exploration helps students come to a deeper understanding of key science concepts. By communicating their ideas, they develop presentation skills and self-confidence.

STEM Fairs involve students in the practice of science and engineering, requiring them to apply those skills to delve deeper into a topic of interest to them. Doing science is the key to understanding science. Data analysis allows students to use vital math skills to understand what is happening in the experiment, as well as how to visually represent what occurred.

Participation in the STEM Fair is optional. Students who complete a STEM Fair project have an opportunity to better learn the process for completing a project of this magnitude and are more comfortable with the project requirements by the time they are in grade five.

On **February 20, 2020**, we will hold our school's STEM Fair where students will present their projects to community partners.

As your child works through his/her project, we encourage you to provide guidance on skills that he/she may not have mastered, such as organizing, researching or typing. However, it is important that your child is challenged and stretched throughout the course of this project and that the project is reflective of an elementary student's work.

Thank you for your time and support throughout this process! We are looking forward to a successful STEM Fair in February!

*2020 Freedom Elementary School Science Fair Committee*

## 2019 STEM FAIR TIMELINE

Project Benchmarks	Date
Testable question due to STEM Fair committee.	<p style="text-align: center;">January 23, 2020</p> <p style="text-align: center;"><a href="https://tinyurl.com/FreedomSTEM">https://tinyurl.com/FreedomSTEM</a></p>
STEM Fair Preparations	<p>Students:</p> <p>Be prepared to answer questions about</p> <ol style="list-style-type: none"> <li>1. Your testable question</li> <li>2. Your hypothesis</li> <li>3. The materials you used</li> <li>4. The procedures you followed</li> <li>5. How you organized your data</li> <li>6. Your conclusion</li> </ol> <p>Parents:</p> <p>Help your child prepare for the STEM Fair</p> <ol style="list-style-type: none"> <li>1. Review the “<b>STEM FAIR DISPLAY PERSONAL ASSESSMENT</b>” on page 6</li> <li>2. Allow your child to practice explaining his/her project</li> <li>3. Remember: animals, bacteria, food or chemicals are NOT allowed at the fair.</li> </ol>
STEM Fair Night	<p style="text-align: center;">February 20, 2020</p> <p style="text-align: center;">5:15 p.m. Volunteers Arrive</p> <p style="text-align: center;">5:30 p.m. Judges Arrive</p> <p style="text-align: center;">6:00 p.m. Doors Open</p>

## STEPS TO SUCCESS

### Step 1: Choose a General Topic to Study

Your topic can be (and SHOULD be!) anything that interests you. What activities do you enjoy? What are your interests? What kind of science is your favorite? Here are a few topic ideas to get you thinking, but remember, you do NOT have to choose something from this list. Be creative!

If you like....	You might do a project on...
Sports	Basketball, soccer, baseball, gymnastics, golf, horseback riding
Nature	Plants, trees, ponds, gardening, rocks, water systems
People	Moods, habits, reaction, genetic traits
Structures	Buildings, bridges, packaging
Weather	Clouds, patterns, air pressure
Physical Science	Electricity, simple machines, movement, sound

Start by listing the topics you would be interested in doing your project on. Narrow it down to the topics you are MOST interested in and from that list, select the one thing you would like to spend the next few months working on. For more help finding a topic, visit the library to research possible STEM Fair projects, ask your teacher or email the STEM Fair committee. Remember, your project MUST have a testable question; do not just make a model.

### Step 2: Ask a TESTABLE Question

A testable question is one that can be answered by designing and conducting an experiment. Choose one question that you would like to answer. Your question should be something you are going to enjoy answering. Once you determine your testable question, then make a prediction about what you think will happen (hypothesis). Remember, if your topic isn't interesting to you then you're going to have a hard time making it interesting to others!!

Your testable question should include:

1. Independent Variable – What is being changed. **“I” control this.**
2. Dependent Variable – What is being measured in an experiment. **“Data collected”**
3. Constants – What is kept the same.
4. Control – Comparison Group

### Step 3: Write a Procedure

List the steps for completing your experiment.

#### Step 4: Conduct Your Investigation

The most important thing to remember during this part of the process is to keep very detailed records. Write down everything you see, every measurement you take, and what questions you are asking. Do not forget to write the date beside everything you write down!

Things to Remember:

- Take photos or draw pictures for your notes and display board. Do not take pictures of yourself – just the materials you are working with!
- Use your logbook to record and date every measurement, observation, and question while you are experimenting. If you don't do this as you are working, you will forget all of that valuable data!
- Create charts and graphs to make your data easy to read.
- Complete at least three trials.

#### Step 5: Draw Your Conclusions

Your conclusion sums up your findings. Write the rough draft in your logbook before writing a final draft.

Your conclusion should tell your reader:

- What happened in your investigations (your results)
- Whether your results supported your hypothesis. If they didn't, that is okay. This is your chance to tell why the results were different than you expected.
- What you learned by doing this investigation and who this information might be helpful to
- What NEW questions and wonderings you had while completing the investigation
- What worked and what didn't work

#### Step 6: Design Your Display Board

Your display is the first thing that people will notice about your project. The board will tell your classmates and the judges what you investigated and what your results were. Include the same sections as your report, but don't include as much information. What is on your board should be a summary of your report

Display Board Design Suggestion

QUESTION	TITLE OF PROJECT	RESULTS <i>(data table, graphs, written explanation)</i>
HYPOTHESIS	PROCEDURE <i>(list procedure)</i>	
MATERIALS <i>(list them out)</i>	VARIABLES	CONCLUSION
	PHOTOS	PHOTOS

## STEM FAIR DISPLAY PERSONAL ASSESSMENT

	Self Assessment	Parent Assessment
Overall project is neat (writing & design)		
All necessary parts included: <ul style="list-style-type: none"> <li>- Testable Question, Hypothesis, Materials, Procedure, Results &amp; Conclusion</li> </ul>		
Spelling is correct.		
Short & catchy title that relates to your question.		
Procedures: <ul style="list-style-type: none"> <li>- are written in sequential order.</li> <li>- show that you conducted repeated trials.</li> </ul>		
You have identified: <ul style="list-style-type: none"> <li>- independent, dependent &amp; constant.</li> </ul>		
You have included: <ul style="list-style-type: none"> <li>- title, labels &amp; units of measurements</li> </ul>		