**Science Fair Student Guide 2015**

**General Information...**

During the next few weeks, you will be expected to design and conduct a scientific investigation to answer a research question that interests you. This science fair project will be broken up into sections that will be spread out over the next three months.

The project should be experimental in nature. You will be using the scientific method to conduct your experiment (a controlled experiment with one independent variable!). Your project should be submitted to me for approval! If I have not approved your project, it needs to be submitted to me this week.

This project will conclude with an **in-house science fair** that will be held in the school cafeteria after school one day in late March or early April. You must attend and present your project to the judges. The judges will be teachers, college students as well as members of the community who have volunteered their time.

The best projects (up to 10) may be entered into the Worcester Regional Science and Engineering Fair on Monday, May 4th. Transportation issues still need to be worked out. If you are able to participate in the fair and you are successful, you can advance to the MA State Science and Engineering Fair that is normally held in June.

**Elements of a Science Fair Project...**

**1) Lab Notebook/Journal:**

This composition notebook should be with you at all times while you work on this project. You must record ALL phases of your project, beginning with ideas for a potential topic up and ending with layout ideas for your display board. All entries must be dated and you cannot erase anything.

**2) Research Paper:**

The research paper will be 2 to 4 pages long and include information that will help you define important terms and concepts, provide enough information so you can develop a reasonable hypothesis, and understand why the experimental results occurred.

**3) Lab Report:**

The lab report includes all of the information learned throughout the course of this project. It helps to organize your research, plans, data, analysis, and final conclusions. You will add to this document as you complete the different components and submit them to me to review. This allows me to give you frequent feedback throughout the project.

The Lab report will include the ***question, hypothesis, materials and procedures, data tables and graphs, photographs, paragraph summarizing results and the conclusion.***

**4) Science Fair Display Board**

Each science fair project will be presented at the team science fair. Students communicate the design and results of their experiment on tri-fold display board. This allows you to display parts of your lab report along with graphs, data tables, and pictures from your experiment.

**The 12 Steps to a Successful Science Fair Project...***(You will get more information about each as we get to that phase of the project.)*

**1) Set up your lab notebook.** The science fair process aims to duplicate what “real scientists” do in a lab setting. It is very important to record everything into the lab notebook so you have a complete record of your project. Think of it as a journal that will hold all of your ideas, research, data, observations, etc

**2) Choose a topic.** This is the most difficult step of this entire project! Good ideas come from your areas of interest. Think about your hobbies or something happening in the world (or your community) that you want to learn more about.

**3)** **Ask a question or define a problem.** It is important that this question can be tested and answered through a science experiment. It should not be too broad or answered with a simple “yes” or “no”.

**4)** **Research published materials related to your question or problem.** Resources can include books, magazines, journals, encyclopedias, websites, etc. Also, talk to professionals in the field! You will create a bibliography for all of your resources.

**5) Make an educated prediction (hypothesis) for the outcome of your experiment.** This prediction should be based on your initial research and often uses the “If...then...” format. You should explain how you came up with your hypothesis.

**6) Plan your experiment.** You must identify all variables involved and design a detailed procedure for your experiment. The plan must include a detailed list of materials that are needed for your experiment. Remember, your experiment must be realistic given the materials you have access to and the time constraint for this project.

**7) Conduct the experiment!** Keep detailed notes of all observations in your notebook and record data in an organized data table. Measurements should be precise, accurate, and include correct units.

**8) Analyze your results.** Once your experiment is completed, you must make sense of your data. Create graphs and look for patterns in your data. Make claims based on evidence from your experiment. Determine whether the experiment helped you answer your research question and consider possible experimental errors.

 **9) Draw conclusions.** Explain your data and summarize what you learned. Were you able to answer your research question? Was your hypothesis correct? Reflect on your experiment and consider next steps and questions you may still have.

**10) Write a lab report.** This sounds intimidating, but all of the work has already been done. You have been building on this each time you submitted part of your project to your peers/ teacher for review. All there is left to do now is to make recommended changes and print out a final draft.

**11) Design the science fair display board.** This is the main presentation tools at the science fair itself. Again, all of the hard work has already been done. All of the information comes right from the lab report. You can add additional pictures, tables, and graphs to help communicate the results of your project. You will have about a week or two to do this.

**12) Present your project!** More information will come home later about the team science fair, but you will present your project to teachers, judges and other students. Each project will have the display board, lab report, and lab notebook. You can also bring props for the table if you want and a laptop.

All information and resources for the science fair can be found on the classroom website:

[**www.mrsspockscience.weebly.com**](http://www.mrsspockscience.weebly.com)