Odyssey Schools
Science Research and Science Project Overview:

The Process (AKA The Scientific Method):

1. Brainstorm ideas and areas of interest to the student
2. Define a question based on your observations in your area of interest ("what is the effect of…")
3. Gather background information and resources
4. Form an explanatory **Hypothesis** or a prediction – what do you think will happen and why? "IF…..THEN….." Remember to limit your "variables" to only one.
5. Plan and design an experiment to test your hypothesis = **Materials and Methods or Procedure**
6. Perform an experiment and collect **Data** to test your hypothesis (prediction)
7. Analyze the data, use graphs, charts, statistics = **Results**
8. Interpret the data and draw **Conclusions** from your data; does your data SUPPORT or REJECT (contradict) your hypothesis?
9. Summarize and communicate/present/publish project data, results and conclusions.

Student Supplies Needed:

1. Science Log Book; 1 Composition book only, no spiral or loose-leaf notebooks
2. Student or parent email account and/or a flash drive.
3. PowerPoint or Google Slides "poster" digital file (no cardboard tri-folds) for presentation. 5th grades students will initially set up these files in class. Research project and PowerPoint to be completed at home (or at school as time permits). Use a Flash Drive to transfer file between home and schoo. Printed poster required for First Place students advancing to District Fair. Poster print to be purchased is optional for students not advancing to District competition in March 2019.

Tips:

1. Your experiment should be a topic that the student has an interest in and a question about…..not something you find on a website in or in a book.
    - For example, if your child likes soccer, think about ways to increase the chances of making a goal…does the amount of air in the soccer ball make a difference for accuracy of the shot?
2. Human studies, animal studies, and any other vertebrate studies are prohibited.
3. Mold and bacterial studies as well as any "cultures" or growth of organisms from the environment are prohibited.
4. Use of weapons or dangerous or toxic materials are prohibited.
5. Keep your experiment simple with a clear cause and effect; "if I do *this*, then *that* will happen".

6. Remember to test only one variable! The longest part of the process is the background research and experimental design. The actual experiment should take no more than a few days (or just hours!) to test.
7. Design experiments with a real-world purpose, how does this help expand or add to new knowledge in your area of interest?
8. Document **all** your work in your log book, your thoughts, ideas, books read, experts you consulted,
9. Use a **pen**, not a pencil. Blue ink is preferred.
10. Date each entry and leave some blank space between entries.
11. Write on only one side of the page (right hand page), not on the back side.
12. Write neatly, crossing out mistakes with a single line or X.
13. Do not rip out pages or erase mistakes.
14. Record your observations **daily**, draw diagrams, write down any changes to your original plan as they occur.
15. Make quantifiable or qualitative measurements, (think in terms of height, length, width, weight, volume, speed, distance…).
16. Use metric measurements (centimeters, grams, milliliters, degrees Celsius etc.)
17. Keep your log book organized and your Table of Contents updated. Use tabs to separate sections such as background research, data, results, conclusion,
18. Use tables, charts and/or graphs to summarize your data.
19. Be sure to label your graphs and charts with a title and with the units of measurement.
20. Use statistics to analyze date; percentages, mean, mode, range.
21. Take many photos of your research as you work on it to document the results.
22. Take photos of your materials and instruments used in the project.
23. Take appropriate safety measures; wear gloves, googles etc.

Requirements:

- Use a composition book (not a spiral bound book or loose-leaf paper) for your log book.
- Your work is a "legal" document; do not tear out pages even if you have made a mistake, do not white-out or erase, simply cross out error neatly and correct the information.
- Prior approval of your project must be in writing from your teacher BEFORE beginning experimentation.
- Repeat your experiment a minimum of 10 trials or an equivalent sample size.
- **Write a 1 page summary of your research.**
- Use a minimum of 3 different reliable sources of information for your background research.
- **Write a bibliography.**
- Construct your science presentation in PowerPoint as you work on the project and complete each step.
- Submit your work to your teacher electronically; by email or on a flash drive.

- No student or school names on the poster but save the file with the student name.
- No items other than your log book, data log, or photo log can be displayed or submitted in the science fair competition.
- A PowerPoint template for the presentation is available on the school website. All required information is shown on the template. Students may change **any** designs, colors, borders, graphics etc. on the presentation! Be creative!
- Do NOT change the size or orientation of the "slide". Your poster will not print correctly.
- Only documented **student** work can be presented on the board as part of the research.
- Do not add photos or graphics of someone else's work unless you "cite" your source. Keep in mind that **plagiarism** is stealing and an act of fraud. Display only your own work and avoid the issue!
- Add a statement in your bibliography section of the poster that reads: "All work including photographs, data, charts and tables by the researcher unless otherwise noted." If a parent takes the photographs, indicate "Photographs by parent."

1st place winners of the community judging event advance to the **District Science Fair** in **March 2019**. **Printed Posters Required for District Fair.**

Information will be sent home with the winners regarding printing the posters.

Sample sources of information on science research:

- http://elementarypgms.brevard.k12.fl.us/science_fairs.htm
- https://student.societyforscience.org/intel-isef
- http://www.sciencemadesimple.com/scientific_method.html
- http://www.sciencebuddies.org/