An Introductory Level Guide with basic information for doing a Science Project

| Observations | Information Gathering | Title | Purpose | Hypothesis | Procedure | Materials | Data | Recording Observations | Results | Calculations | Questions | Conclusions | What If Project Doesn't Work?

- INITIAL OBSERVATION -You notice or see something & wonder why it happens or what causes it. You want to know how or why something works. You ask questions about what you've observed. Write down what you noticed.
- INFORMATION GATHERING - Find out about what you want to investigate. Read books, magazines, ask professionals who might know in order to learn about effect or area of study. Keep track of where you got your information
- TITLE THE PROJECT - Choose a title that describes the effect or thing you are investigating. The title should summarize what the investigation will deal with.
- STATE THE PURPOSE OF THE PROJECT - What do you want to find out? Write a statement that describes what you want to do. Use your observations and questions to write the statement.
- MAKE HYPOTHESIS - Make a list of answers to the questions you have. This can be a list of statements describing how or why you think the observed things work. *Hypothesis must be stated in a way that can be tested by an experiment*.
- DESIGN AN EXPERIMENTAL PROCEDURE TO TEST YOUR HYPOTHESIS - Design an experiment to test each hypothesis. Make a step-by-step list (called an experimental procedure) of what you will do to answer your questions
  - Guidelines for Experimental Procedures
    - Select only one thing to change, variables, in each experiment. Change something that will help test your hypothesis.
    - The procedure must tell how you will change this one thing & explain how you will measure the amount of change.
- OBTAIN MATERIALS & EQUIPMENT - Make a list of the things you need to do the experiments, and prepare them. If you need special equipment, a local college or business may be able to loan it to you. Another source of science materials are mail order or professional supply houses. They will have just about anything you will need.
- DO THE EXPERIMENT AND RECORD DATA - Do the experiment and record all numerical measurements made. Data can be amounts of chemicals used, how long something is, the time something took, etc. If you are not making any measurements, you probably are not doing an experimental science project.
- RECORD YOUR OBSERVATIONS - Observations can be written descriptions of what you noticed during an experiment, or problems encountered. Keep careful notes of everything you do, and everything that happens. Observations are valuable when drawing conclusions, and useful for locating experimental errors.
- CALCULATIONS - Perform any math needed to turn raw data recorded during experiments into numbers you will need to make tables, graphs or draw conclusions.
- SUMMARIZE RESULTS - Summarize what happened. This could be in the form of a table of numerical data or graphs. It could also be a written statement of what occurred during the experiments.
- DRAW CONCLUSIONS - Using the trends in your experimental data and your experimental observations, try to answer your original questions. Is your hypothesis correct? Pull together what happened & assess experiments you did.
  - Other Things You Can Mention in the Conclusion
    - If your hypothesis is not correct, what could be the answer to your question? What would you do different next time?
    - Summarize any difficulties or problems you had doing the experiment. Do you need to change procedure & repeat your experiment
- TRY TO ANSWER RELATED QUESTIONS- Many questions are related. Several new questions may have occurred to you while doing experiments. You may now be able to understand or verify things you discovered when gathering information for the project. Questions lead to more questions, which lead to additional hypothesis that can be tested.
- WHAT IF MY SCIENCE PROJECT DOESN'T WORK? - No matter what happens, you will learn something. Science is not only about getting "the answer." Knowing that something didn't work is actually knowing quite a lot. Experiments that don't turn out as planned are an important step in finding an answer.