**Science Fair Detailed Tips**

**The best topic** will be about something that you enjoy. Think about things that you are interested in and make a list of what you know and what you want to know about the topic. Another way to come up with a topic is to think of something you have seen (like a paper airplane flying across a room) and ask yourself a “I wonder what would happen if...” question (I wonder what would happen if I made the airplane out of cardboard, would it fly farther?). Once you have an idea about what you want your experiment to be, then you need to phrase it as a question – a testable question that you need to do an experiment to answer. Let’s Review What is my problem?

**Now I need a hypothesis** A hypothesis is a prediction or educated guess about what will happen in your experiment. Use your past experiences and what you already know about your topic to help you make a hypothesis. A hypothesis can be stated as an “if - then” statement. “If this changes, then this will happen.” Example: If a paper airplane is made from construction paper, then it will fly farther than an airplane made from regular computer paper. Before you write your hypothesis, you need to decide what you are going to change and what you are going to measure in your experiment. IF YOUR DATA DISPROVES YOUR HYPOTHESIS DO NOT CHANGE YOUR HYPOTHESIS! Disproving your hypothesis can lead to amazing new discoveries and can make your project even more exciting.

**What are my variables**? Parts of an experiment that can change. Independent Variable (manipulated variable) Dependent Variable (responding variable) Controlled Variables: When conducting an experiment, all other variables must be kept the same throughout the investigation; they should be controlled. Remember: The independent variable goes on the X-axis and the dependent variable on the Y-axis.

**My Materials List** Make a detailed list of what you need to do your experiment. Remember measuring tools and safety equipment. Try to list out exact measurements of materials if you know them (use metric measurements). If you are using a specific brand name – name it. Make sure you have enough material to do at least 3 trials. If you think of something you will need as you are doing your experiment, make sure you add it to your materials list.

**Experimental Procedure** Write a step-by-step procedure, list out exactly what you are going to do. You want your procedure to be so detailed that another student could follow your procedure and do the experiment exactly the same way you did. If you think of details as you are doing your experiment or make changes in your procedure, be sure to write those changes down in your procedure as well. Make sure you are repeating your experiment at least 3 times.

**Data Collection** All experiments require data. During your experiment keep a log of the data you collect and any observations you make. Before you start your experiment, make a data table where you can collect your data. If something unexpected happens as you are collecting your data – write it down! Take photographs as you are doing your experiment. Remember to keep your face out of the photographs.

**Results** You have collected your data. Now what do you do? Average your data. Use a graph to help explain your data. Choose a type of graph that will best show any patterns, changes (or lack of changes) in your data: Circle Graph, Bar Graph, Line Graph. Use photographs to illustrate changes.

**Conclusion** Your conclusion should be written in the format given to you by your science teacher. At a minimum it should: restate your question and hypothesis, state whether your hypothesis was proven correct, provide evidence (data) to support your claim, and provide thoughtful explanations or inferences about what you found.