**ELEMENTS OF AN EXPERIMENTAL PROJECT**

*   **Background Research**: helps you understand your topic AND helps you come up with a problem/testable question to investigate in your experiment.
*   **Problem/Testable Question**: the specific question you will investigate in your experiment.
  + *For example: How does the temperature of a tennis ball affect the height of it’s bounce?*
*   **Hypothesis**: what you think will happen in your experiment based on your background research. You will design your experiment to test your hypothesis. Write your hypothesis using the **“If, then, because”** format.
* *e.g.,* ***If*** *I drop a basketball from 1 meter above the ground* ***then*** *it will bounce the highest when dropped on concrete* ***because*** *concrete is the most dense material.*

***Think of the following when writing your hypothesis:***

* ***What is my problem?***
* ***What do I think the answer is?***
* ***Why do I think that is the answer (based on prior research)***
*   **Variables:** 
  + **Controlled** variable: the variable that is held constant (the same) throughout the experiment; what you keep the same in experiment;
  + *e.g., person dropping the ball, the ball, height the ball is dropped… etc*
  + **Independent** variable *(manipulated variable*): the one variable that is changed; **ONE** thing that is purposely **changed** in the experiment; what is changed in order to see what happens in the experiment.

*e.g. the surface the ball is dropped onto*

* + **Dependent** variable *(responding variable):* the variable that is being tested and measured; what happens as the result of changing something; what you observe happening when changing the variable.
  + *e.g. the height of the bounce of the ball*
*   **Materials**: a list of all materials used in the experiment.
  + *e.g. one basketball, one chair, one measuring tape etc.*
*   **Procedure**: a **step-by-step** explanation of how you did your experiment, including the number of trials and sample size in each trial. You should do **at least three trials** (whole procedure conducted three times) to show the “reproducibility” of results.
*   **Results/Observations**: collect your data and record it in a logbook. The data should be summarized in a table or a graph. Be sure to label the axes correctly, and include the units of measurement (if applicable.)
*   **Conclusion**: the final outcome of your investigation as confirmed by your data/observations; your conclusion should **prove or disprove** your original question/hypothesis.
*   **Application/Extension**: explain why people would be interested in knowing your results and how they can use your results. Also explain how you would do your experiment differently in future or how you could do it better another time.