Driving Question: How do we use the process of inquiry (scientific method) to study the natural world?

Artifact: Using the "Process of inquiry," complete the following steps in order to contribute to the body of knowledge (yay science!). Record the process in your science notebook.

Observation: Using a "wonder-wander," make an observation that can be used to spur a question. You can do this in your house, at school, or at your favorite place or park. An interesting observation generates a question that prompts you to learn more (by conducting an experiment or meta-research.)

Question: Develop a scientific question. Scientific questions have real answers, are testable, have a hypothesis that is falsifiable (can be proven wrong), and is interesting! Examples of good question starters are "What is the relationship between..." "What factors cause..." and "What are the effects of...."

Develop Hypothesis: Make a prediction of the various outcomes you expect out of your experiment. There are usually at least three: Two alternating hypotheses: H1/H2(a positive and negative correlation between your variables), and the Null hypothesis: H0, which means there is not a correlation between variables.

Plan and Test: Write out the important parts of an experimental design.

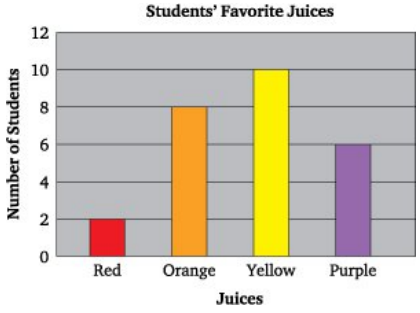
Independent variable: What variable are you purposely changing in your experiment?

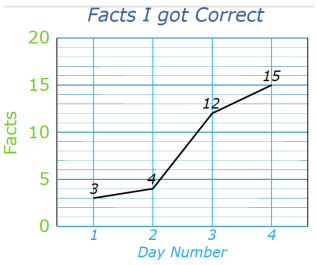
Dependent variable: What will you go out and measure? What data will you collect?

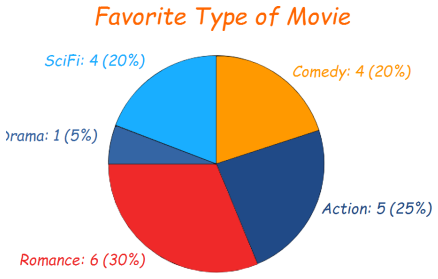
Control group: What will you compare your results to?

Constants: What other variables will you keep the same between your trials in order to isolate the independent variable (the only one you are purposely changing.)

Analyze and Interpret: Create a graph that shows the relationship between your independent variable and your dependent variable. You may use a bar graph, line graph, or pie chart, depending on your results. The independent variable goes on the x-axis (horizontal), and the dependent variable goes on the y-axis (vertical).







Conclude and Report: Using the technique "Claim-Evidence- Reasoning" write out a conclusion in your notebook to make a strong scientific argument. First, make a claim (ie, answer your scientific question). Then in a concise way, present the strongest evidence, followed by supporting evidence (from your experiment or research). Finally rationalize *why* your data supports your conclusion. This is the "because" part of the conclusion.

Reflect and Rethink: Reflect on the challenges to this process. What would you do differently next time? What additional questions do you have based on your findings? Are there Sources of Error in your experiment? How could you minimize them? What were some of the roadblocks/errors/tricky parts of the process of science? How could these problems be solved?

Grading Rubric:

Learning Goals:	Advanced (4)	Proficient (3)	Partially Proficient (2)	Not Yet Proficient (1)
Develop scientific questions. Design and conduct and experiment. Develop scientific arguments (using Claim-Evidence-Reasoning (C-E-R)	In addition to the proficient column: Experiment is clear and the outcomes are predicted. Data is represented accurately in a graph and table. Student has a thoughtful "reflection" on the process.	All evidence is reflected in science journal (neat and labeled). Scientific question is narrow, and can be answered by conducting an experiment or doing research. Experimental design includes IV/DV/CG/Constants Data is present. Scientific argument includes C-E-R.	"Process" is recorded, but is disorganized or hard to follow. Question is present but it is too broad, or not well-defined. Experiment is explained, but IV/DV/CG/Constants not identified. Data is disorganized, but present. Scientific argument makes a claim and provides evidence, but does not include reasoning.	Large aspects of the "process" are missing. Question is a "why" question. Experiment does not accurately answer question. Data is inaccurate or missing. Scientific Argument is inaccurate or missing.