

## **Buffalo Academy of Scholars Science Standards**

(Based off of Next Generation Science Standards)

### ***Middle School Levels (6-8)***

Science and Engineering Practices: Students who demonstrate understanding can:

1. Formulate, refine, and evaluate empirically testable questions.
  - a. Evaluate questions that challenge the premise of an argument, the interpretation of a data set, or the suitability of a design.
2. Use and synthesize models to predict and describe phenomena. Emphasis is placed upon developing models to describe phenomena that are more abstract and unobservable.
3. Plan and carry out investigations to provide evidence to support explanations or solutions. Progressively, the students' investigations will include multiple variables.
  - a. Conduct an investigation to produce data to serve as evidence for the validity of a model, using fair tests in which variables are controlled and the number of trials is considered.
4. Use computational thinking and mathematical representations of phenomena to support claims.
  - a. Progression towards pattern identification in large data sets.
  - b. Algebraic thinking and analysis, linear and nonlinear functions will be used to analyze, represent, and model data.
  - c. Mathematical representations support scientific conclusions and design solutions.
5. Analyze and interpret data using logical reasoning, basic statistical analysis, error analysis, the comparison of data sets, and the use of models to make sense of natural phenomena.
  - a. Analyze data using tools, technologies, and/or models in order to make valid and reliable scientific claims or determine an optimal design solution.
  - b. Distinguish between correlation and causation in comparison of students' data.
6. Obtain, evaluate, and communicate information and evaluate the validity and reliability of the claims, methods, and designs.
  - a. Communicate scientific and technical information in multiple formats including orally, graphically, textually, and mathematically.
  - b. Information about phenomena should be properly obtained and cited from physical experimentation, print, or digital sources. Each source should be analyzed for bias.

7. Engage in argument supported by appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed worlds. Arguments may come from current scientific or historical episodes in science.
  - a. Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.
  
8. Construct explanations and design solutions that are supported by student-generated sources of evidence to support or refute an explanation about the natural and designed worlds.
  - a. Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources and the assumption that theories and laws that describe the natural world are consistent.
  - b. Evaluate a competing explanation using jointly agreed upon and developed criteria.