NGSS SCIENCE AND ENGINEERING PRACTICES

ASK QUESTIONS AND DEFINE PROBLEMS

- I formulate empirically answerable questions
- I establish what is already known
- I determine what questions have yet to be answered
- I define constraints and specifications for a solution

DEVELOP AND USE MODELS

- I construct mental and conceptual models to represent and understand phenomena
- I use models to explain and predict behaviors of systems, or test a design
- I refine my models in light of new empirical evidence

PLAN AND CARRY OUT INVESTIGATIONS

- I identify questions to be investigated
- I identify variables and controls
- I design and perform experiments to test my hypotheses
- I decide what data will be collected and how much, and what tools are needed

ANALYZE AND INTERPRET DATA

- I use tables, graphs, spreadsheets, etc. to display and analyze data
- I recognize patterns in data and see relationships between variables
- I revise my initial hypothesis when the data doesn't support it
- I analyze performance of a design under a range of conditions

USE MATHEMATICS AND COMPUTATIONAL THINKING

- I use mathematics and statistics to analyze data
- I express relationships between variables by writing mathematical models or equations
- I use technology to collect and analyze data
- I use mathematical models and computer simulations to test my predictions and designs

CONSTRUCT EXPLANATIONS AND DESIGN SOLUTIONS

- I evaluate information and form hypotheses
- I construct explanations or models of phenomena
- I design a variety of solutions to a problem

ENGAGE IN AN ARGUMENT FROM EVIDENCE

- I defend my explanation
- I formulate evidence based on solid data
- I examine my own understanding in light of the evidence
- I collaborate with my peers in searching for the best explanation

OBTAIN, EVALUATE AND COMMUNICATE INFORMATION

- I communicate findings clearly and persuasively
- I derive meaning from scientific text
- I engage in discussions with scientific peers
- I evaluate the validity of the findings of others