The eCYBERMISSION program gives students the chance to explore how science, technology, engineering, and mathematics work in their world. This emphasis on STEM and a chance for students to engage in inquiry practices makes eCYBERMISSION an excellent addition to your classroom. The new (2016) New York State Science Standards very closely relate to the Next Generation Science Standards (NGSS), so the information below has been taken directly from the NGSS. Also, based on the direction you give your students their specific investigations can meet content standards (not listed here).

Scientific and Engineering Practices:

1. Asking Questions and Defining Problems

This is a requirement in the Mission Folder. Students who choose Scientific Inquiry Using Scientific Practices must write a problem statement that identifies a real-world, community-based problem they are trying to solve by developing a hypothesis and an experiment. Students who choose Engineering Design must also define a real-world, community-based problem and try to solve it with their engineering design.

2. Developing and Using Models

Students who choose Scientific Inquiry Using Scientific Practices may develop and use models during their investigation in order to collect data and help to try to answer the question they are exploring. Students who choose Engineering Design must design a prototype (or model) of their design and test that prototype.

3. Planning and Carrying Out Investigations

During the eCYBERMISSION competition, students must plan and carry out an investigation. This is the main focus of the Mission Folder that students complete and submit in order to compete. Students who choose Scientific Inquiry Using Scientific Practices need to design an experiment to collect data. Students who choose Engineering Design need to design an investigation to identify the effectiveness, efficiency and durability of their designs.

4. Analyzing and Interpreting Data

Students will be collecting data throughout their investigations during the eCYBERMISSION competition and then need to analyze and interpret the data they have collected.

5. Using Mathematics and Computational Thinking

As part of the eCYBERMISSION competition, students must use mathematics and computational thinking in order to understand and manipulate the data they have collected in an effort use that data to come to a data-supported conclusion.

6. Constructing Explanations and Designing Solutions

This is the main goal of an eCYBERMISSION project. Students who choose Scientific Inquiry Using Scientific Practices will be attempting to construct an explanation to the question they are asking based on the data they collected through their experiment. Students who choose Engineering Design will be attempting to design a solution to the problem they chose, using the data they collected throughout their investigation.

7. Engaging in Argument from Evidence

As part of the Mission Folder students are required to state why the problem they chose is important to the community, why their solution would or would not be effective in solving this problem, and how their investigations helped to solve the problem. In addition, they are asked what the next steps in solving this problem might be and what additional investigations could be completed based on their results. All of these are arguments based on evidence collected by the students in a real-world setting, helping to make the science and engineering relevant to them and their lives.

8. Obtaining, Evaluating, and Communicating Information

The Mission Folder itself is an extension of this Practice. Students will be obtaining information through research, group discussion, data collection, and more. They will need to evaluate the information they gather and decide if it supports their hypothesis or design statement. And finally they must communicate this information by completing the Mission Folder. Should they move on to the regional or national competition, they will have the chance to communicate this information orally as well.

The eCybermission program gives students the chance to explore how science, technology, engineering, and mathematics work in their world. This emphasis on STEM and a chance for students to engage in science and engineering practices makes eCybermission an excellent addition to your classroom. Below you can find the Engineering, Technology, and Applications of Science (ETS) performance expectations that align with eCYbermission from the Next Generation Science Standards. Also, based on the direction you give your students their specific investigations can meet Physical, Life, and Earth and Space Science standards (not listed here). For integration of traditional science content with engineering through a practice or disciplinary core idea, look for an * at the end of performance expectations in the Physical, Life, and Earth and Space Science standards in the Next Generation Science Standards document.

Middle School

Students who demonstrate understanding can:

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

High School

Students who demonstrate understanding can:

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.