Name: _____

Date: _____

Science and Engineering Scenarios

Scenario 1: How does the boll weevil affect the cotton plant life cycle?

- Plan and carry out an investigation into the population of boll weevils affecting the cotton plant life cycle.

- Use mathematics and computational thinking to analyze and interpret data from the boll weevil investigation.

- Develop and use models to construct an explanation for the role of the boll weevil on the cotton plant life cycle.

- Use data interpretations to construct an explanation for the role of the boll weevil on the growth and success of the cotton plant life cycle.

- Use data to identify the problems of boll weevils affecting cotton plant life cycle.

- Design and test solutions to the boll weevil problem affecting cotton plants.

- Develop and use a model of the possible solution(s) (prototype).

- Construct and communicate an argument for farmers to use boll weevil traps.

Scenario 2: How does the availability of water affect growth and success of different species of cotton plants?

- Plan and carry out an investigation into different species of cotton plants that require different amounts of water.

- Use mathematics and computational thinking to analyze and interpret data from the investigation to construct an explanation for which species might be better suited in different environments.

- Use data to identify the problem of water availability on a specific species of cotton plant's life cycle.

- Plan and carry out an investigation into different irrigation systems.

- Use mathematics and computational thinking to analyze and interpret data from the investigation into different irrigation systems.

- Develop and use a model of the possible solution(s) (prototype).

- Use data to construct an argument for which irrigation system is best for a specific environment.

Scenario 3: Use cotton production data to identify the problems associated with separating the cotton seed from the boll.

- Plan and carry out an investigation into ways for separating seeds from cotton bolls.

- Use mathematics and computational thinking to analyze and interpret data from the investigation to design a solution.

- Develop and use a model of the possible solution(s) (prototype).

- Use data to construct an argument for which seed separation system is best improving cotton production.

Scenario 4: How do available nutrients in the soil affect growth and success of cotton plants?

- Plan and carry out an investigation into different nutrients in the soil that affect cotton growth.

- Plan and carry out an investigation into how different nutrients in the soil that can be replaced.

- Use mathematics and computational thinking to analyze and interpret data from the investigation to construct an explanation for which nutrients might be replaceable.

- Use data to identify the problem of nutrient availability affecting a cotton plant's life cycle.

- Use mathematics and computational thinking to analyze and interpret data from the investigation into different nutrient replacement options.

- Develop and use a model of the possible solution(s) (prototype).

- Use data to construct an argument for which solution is best.