



DRIVING QUESTION

How can we use quadratic functions and systems of equations to help a North Carolina farm maximize profit while balancing land, labor, and environmental constraints?

PROJECT SUMMARY

Students will be asked to research the local market to find farm lands for sale with teacher feedback. Budgets will be randomly distributed to groups. Students will then create a mathematical model using quadratic functions and systems of equations/inequalities in order to optimize how much of each crop they will grow. Lastly, using their models, they will decide what to recommend to the farmers for the balance of corn versus soy bean crops based on their budgets, labor limitations, and environmental limitations.

REAL-WORLD CONTEXT

Farmers have to decide what crops to grow and how much of each based on their real-world constraints. Also, there isn't always an exact answer so they have to make their best judgement based on the facts they have. Some students might be interested in running their own businesses someday, so it shows them how to analyze real world data through mathematical models to help make decisions that benefit the company. While the data is made up for the crops, students will use skills such as searching the market to investigate what land they would purchase and what that means for their acreage.

PRODUCTS & AUDIENCE

Students created presentations to share with local farmers.

STUDENT REFLECTIONS

- "I learned how to play a role in a team and how to better back up my choices."
- "I grew as a team partner. We were struggling in the beginning but we resolved the conflicts and finished the project."
- "I grew more in researching and contextualizing data."
- "It was neat to understand what work goes behind starting a business, and all the prior research that is necessary."
- "This project helped expand my knowledge of how quadratics work."
- "The communication protocols within the group helped because we had to discuss our work outside of school."

NC PORTRAIT OF A GRADUATE SKILLS GAINED



COLLABORATION



COMMUNICATION



PERSONAL RESPONSIBILITY



CRITICAL THINKING



LEARNER'S MINDSET

TEACHER REFLECTION

"The students did a really good job connecting the maximums of the quadratic functions to help maximize the profit of their farms. I do wish it was more evident earlier in the project why they are doing what they are doing."