Understanding Iowa's Farmland

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Part I: Overview of Workplace

John Deere was a skilled blacksmith who invented a plow in 1837. He would be proud to know that the innovation has not stopped since then. Today, Deere is changing the massive landscape of agriculture. The Intelligent Solutions Group (ISG) works to further the company's vision of a future farm, powered by technology to help farmers sustainably feed our growing world.

Part II: Workplace Focus

Here are just a few examples of the types of projects the employees of ISG work on together each day:

- Designing ultra-efficient farm machinery
- Conducting research on all things related to agriculture
- Developing software
- Engineering robots/artificial intelligence
- Analyzing massive amounts of data from Deere customers

Part III: Introduce the Problem

The company needs to find out critical information about John Deere customers' land in order to inform machinery design. Information like location, elevation, and potential problem areas in fields could also help farmers make decisions.

Students will be given satellite images of agricultural land in Iowa. They will need to plot coordinates using latitude and longitude and calculate geometry related to the field polygons. Students will analyze their maps and brainstorm how machines or conservation practices could optimize sustainability and yield.

Part IV: Background

In order to successfully engage in this project, students will need experience with:

- Finding area of polygons
- Plotting coordinates in a plane
- Map reading
- Map making
- Basic statistics
- Basic understanding of erosion and agricultural practices

Part V: Workplace Solution

To solve this problem, ISG employees use satellite images and computer programs to create and analyze high resolution maps of agricultural land. They also use high level statistics to analyze data from John Deere machines and other sources.

Part VI: Educational Pathways

Most of the great problem solvers at ISG have either a masters or doctorate degree in agronomy, computer programming, engineering, data science, or other areas.