

**GOLD  
SEAL  
LESSON**

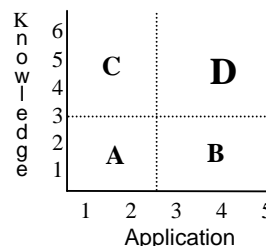


**To Mow or Not to Mow**

Career Cluster: Business

**Subject(s)**  
Plant Systems

**Rigor/Relevance  
Framework**



**Grade Level** 9–12

**Instructional  
Focus**

**Reading:** Students read a variety of grade level materials, applying strategies appropriate to various situations

**Writing:** Students write for a variety of purposes and audiences with sophistication and complexity appropriate to the grade level.

**Listening:** Students listen for a variety of purposes appropriate to the grade level.

**Speaking:** Students speak for a variety of purposes and audiences with sophistication and complexity appropriate to the grade level.

**Number Operation and Concepts:** Students use number, number sense, and number relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.

**Measurement:** Students use a variety of tools and techniques of measurement in a problem-solving situation. Students communicate the reasoning used in solving these problems.

**Tools and Technology:** Students use appropriate tools and technologies to model, measure, and apply the results in a problem-solving situation. Students communicate the reasoning used in solving these problems.

**Problem-Solving and Mathematical Reasoning:** Students apply a variety of problem-solving strategies to investigate and solve problems from across the curriculum as well as from practical applications.

**Student  
Learning**

- Students will understand and apply the budgeting process.
- Students will demonstrate solid decision making and project sensitivity skills.
- Students will demonstrate competence in the areas of math that include calculation of area, summation of data, and maintaining units of measure.
- Students will learn to apply good organization skills to determine properly the most cost-effective decision to maintain a highway.
- Students will properly communicate his/her presentation of findings and defense of position to maintain a highway properly.

**Performance  
Task**

**Overview**

This unit will focus on increasing student’s knowledge and competencies in the area of business decision making. Students will be grouped in teams of 2–3 to complete a feasibility analysis to determine if it would be more cost-effective to continue to mow the slopes of the highway that runs from one town to the next or if it would be better to plant a ground cover that will require minimal maintenance. Students will need to understand and apply various business concepts that include decision making, project sensitivity, organization skills,

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**Performance Task**  
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and communication skills. Students will create a spreadsheet and persuasive essay to justify their decisions and then communicate their findings to the class via a presentation. Students will need to answer all questions and/or defend their position to their classmates.

**Description**

In this activity, students will be asked to perform various business decision-making skills to determine whether to maintain the roadsides of a highway. The students will create a spreadsheet demonstrating their analysis of the competing projects with supporting calculations. Students will develop a persuasive essay describing the issue, the analysis process, and their conclusion. Students will need to utilize various skills in the disciplines of math and English language arts. These skills will aid the students when they obtain and disseminate information needed to determine the best course of action for the maintenance of the highway. Students will be asked to work cooperatively in a team of 2 or 3 on their analysis of the problem, persuasive essay, and their conclusion. Students will present their information to the class in a professional manner and prepare to defend their position as the rest of the class questions the conclusion of the group.

Please refer to the To Mow or Not to Mow Instructional Plan (attached). Present students with the overview of the project. Arrange access to the required technology and materials needed to complete their project.

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**Essential Skills**

- E3 Follow oral directions.
- E7 Research information from a variety of sources and draft a well-organized, accurate, and informative report or essay that engages an audience and addresses its needs.
- E9 Organize supporting detail in logical and convincing patterns that focus on audience and purpose.
- E10 Participate in (sometimes leading) one-on-one or group discussions by asking questions, asking for clarification, taking turns speaking, agreeing and/or disagreeing courteously, making informed judgments, and working toward a common goal.
- E16 Locate and gather information such as data, facts, ideas, concepts, and generalizations from oral sources.
- M5 Examine problem-solving situations involving simple probability and use probabilistic reasoning to compare and communicate the theoretical or empirical likelihood of events.
- M9 Compute the perimeter and area of common two-dimensional figures.
- M12 Understand accuracy and precision of measurement, round off numbers according to the correct number of significant figures, and determine percent error.
- M17 Understand the importance of random sampling and sample size in generating representative data.
- M21 Evaluate and employ accurate and appropriate procedures for statistical data collection, organization, analysis, and display including making estimates and predictions, critiquing data, and drawing inferences (e.g., using the normal curve and z-scores, line of best fit).
- M22 Interpret data to determine correlation and distinguish between correlation and cause and effect.

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**Scoring Guide**

Attached

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**Attachments/  
Resources**

To Mow or Not to Mow Instructional Plan

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**Submitted by:** Mike Feliciani, Souderton High School

## Scoring Guide

CATEGORY	4	3	2	1
<b>Attitude</b>	Never is publicly critical of the project or the work of others. Always has a positive attitude about the task(s).	Rarely is publicly critical of the project or the work of others. Often has a positive attitude about the task(s).	Occasionally is publicly critical of the project or the work of other members of the group. Usually has a positive attitude about the task(s).	Often is publicly critical of the project or the work of other members of the group. Often has a negative attitude about the task(s).
<b>Group Interactions</b>	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Usually listens to, shares with, and supports the efforts of others. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.
<b>Contributions</b>	Routinely provides useful ideas when participating in the group and in classroom discussion. A definite leader who contributes a lot of effort.	Usually provides useful ideas when participating in the group and in classroom discussion. A strong group member who tries hard!	Sometimes provides useful ideas when participating in the group and in classroom discussion. A satisfactory group member who does what is required.	Rarely provides useful ideas when participating in the group and in classroom discussion. May refuse to participate.
<b>Spreadsheet Analysis</b>	Comprehensive usage of the application. Visually superior in presentation and accurately built.	Usage of the application shows accurate calculation. It is visually appealing with basic design elements.	Usage of the application shows some design errors. It is visually confusing and without much formatting.	Usage of the application is careless and has many errors in creation. It is visually confusing and without formatting.
<b>Analysis Essay</b>	Essay clearly defines the issue. The data gathered and the analysis is clearly stated with concise explanation. Grammar and punctuation are accurately applied.	Essay defines the issue with adequate accuracy. The data and analysis are fully stated with some areas out of sequence. There were few grammar and punctuation errors noted.	Essay failed to accurately define the issue. The description of the analysis is inaccurately stated and contained errors. Grammar and punctuation are inaccurately applied.	Essay did not define an issue. The analysis and conclusion are confusing and inaccurate. Essay contained numerous grammar and punctuation errors.
<b>Presentation of Findings</b>	Presentation was of professional quality. Chosen medium created interest and was clearly delivered. Presenters were clear and articulate in their delivery of the material.	Presentation was of decent quality. Medium chosen was interesting to the viewer. Presenters delivered material somewhat effectively.	Presentation was somewhat disorganized. Method of delivery failed to interest the audience. Presenters were difficult to understand and follow.	Presentation lacked focus. Method of delivery lacked effort and effectiveness. Presenters were distracting and ineffective.

## To Mow or Not to Mow Instructional Plan

This unit will focus on increasing students' knowledge and competencies in the area business decision making. Students will be grouped in teams of 2–3 to complete a feasibility analysis to determine if it would be more cost-effective to continue to mow the slopes of the highway that runs from one town to the next or if it would be better to plant a ground cover that will require minimal maintenance. Students will need to understand and apply various business concepts that include decision making, project sensitivity, organization skills, and communication skills. Ask students to create a spreadsheet and persuasive essay to justify their decisions and then communicate their findings to the class via a presentation. Culminate this unit with students answering all questions and/or defending their position.

Listed below are some suggested methods for delivering the To Mow or Not to Mow unit. These lessons and procedures can be modified to fit your particular classroom environment and/or time allotment.

As previously stated in the Student Learning section of this lesson, instruction in this unit should result in students achieving the following objectives:

- 1) Students will understand and apply the budgeting Process.
- 2) Students will demonstrate solid decision-making and project sensitivity skills.
- 3) Students will demonstrate competence in the areas of math that include calculation of area, summation of data, and maintaining units of measure.
- 4) Students will learn to apply good organization skills to determine the most cost-effective decision to maintain a highway.
- 5) Students will properly communicate his/her presentation of findings and defense of position to properly maintain a highway.

### Teacher Procedures

1) The overall goal of this lesson is to increase students' knowledge and competencies in the area of making sound business decisions. Define and discuss with the students the various business components/terminologies required to achieve success. Discuss and define the concepts and skills below.

1. Budgeting process
2. Decision making
3. Project sensitivity skills

2) Discuss and demonstrate with the students the required mathematical calculations that may be needed for this unit. Cover the math concepts listed below.

1. Calculation of area
2. Summation of data
3. Units of measure

3) Provide the students with specific data up front. Leave some of the required data purposefully out. Provide several sets of data with different sets of numbers. This will ensure that each group will be working on a unique problem.

Data needs to include:

1. The previous year's expenses related to maintaining the roadsides of the highway
2. The distances of the roadside and the length of the highway
3. The upfront expenses associated with purchasing equipment to maintain the new system

Intentionally omitted information would include:

1. The resale of the old equipment
2. Impact of weather
3. Labor requirements
4. Speed of maintenance

The students should be brainstorming ways in which the expenses might be affected rather than being provided a list. Student data will be altered from one group to the next to ensure different outcomes from the study.

4) Discuss with the class the importance that good communication skills have in the potential work environment and that enhancing these skills will be very important in the future. Students will present their information to the class in a professional manner and prepare to defend their position as the rest of the class questions the conclusion of the group.

5) Assessment: Have students turn in their spreadsheet and persuasive essay for a grade. Students will be assessed using the scoring guide attached.

### **Student Activities**

1) Students will create a brainstorming analysis to try and determine all the points of data they will need and scenarios that they will need to consider before beginning the study.

2) Students will create a spreadsheet showing all the calculations and the inputs that they are using to complete the associated math. They will gather and report any information that was not provided in the initial package.

3) Students will write the narrative for their proposal. This will be in the form of a persuasive essay with explanations of calculations and supporting data.

4) Students will present and defend their decision. They must clearly and concisely show how they arrived at their decision outlining the options and where the financial savings are greatest. This is open to how they wish to present their conclusions.