UNIT 4

Unit 4 Project

***Mathematics 10*, page 506**

Suggested Timing

90–120 min

Blackline Masters

Master 1 Project Rubric
BLM U4–3 Unit 4 Project Final Report

Mathematical Processes

✓ Communication (C)
✓ Connections (CN)
✓ Mental Math and Estimation (ME)
✓ Problem Solving (PS)
✓ Reasoning (R)
✓ Technology (T)
✓ Visualization (V)

General Outcome

Develop algebraic and graphical reasoning through the study of relations.

Specific Outcomes

RF9 Solve problems that involve systems of linear equations in two variables, graphically and algebraically.

Planning Notes

Begin by brainstorming ways in which individuals can reduce water use in their homes. Encourage students to share what they know about retrofitting homes to reduce water use. Then, ask students how some of this information might be shown using what they learned in Chapters 8 and 9 about solving systems of linear equations graphically and algebraically.

You may wish to list and post students' thoughts from the brainstorming session. Encourage students to use the ideas as a springboard to develop their project. Explain that they will complete an analysis of reducing water use in homes and retrofitting homes with water-efficient plumbing fixtures. Review the expectations for the project outlined on page 506 of the student resource. Clarify with the class that the analysis should include

- data involving the effect of our water use on populations of wildlife
- information about costs and flow rates of various low-flow plumbing fixtures
- a comparison using linear systems (represented multiple ways) of the cost of keeping conventional fixtures and the cost of retrofitting

Encourage students to think about what format they might use to present their work. Students may wish to create a written report, oral presentation, PowerPoint presentation, or video presentation, or they may prefer another format of their choice. Explain that the presentation should outline the environmental and economic benefits of retrofitting and reducing water use. The student resource lists the questions that each presentation should address. Read and discuss this list of questions so that all students are clear on the assignment.

If students completed #8 in section 6.1 of Chapter 6, you may wish to refer them to this question since it may be useful to them as they work on their project.

Suggest that students review the contents of their project portfolio and ensure that they have completed all of the required components for their final analysis and presentation.

Assessment	Supporting Learning
Assessment *of* Learning	
Unit 4 Project The unit project gives students an opportunity to apply and demonstrate the concepts, skills, and processes learned in Unit 4. **Master 1 Project Rubric** provides a holistic descriptor that will assist you in assessing student work on the Unit 4 project.	• You may wish to have students use **BLM U4–3 Unit 4 Project Final Report**, which provides a checklist for students to identify where in their project they demonstrate the concepts, skills, and processes explored in Unit 4. • Reviewing **Master 1 Project Rubric** with students will help clarify the expectations and the scoring. It is recommended to review the scoring rubric at the beginning of the unit, as well as intermittently throughout the unit to remind students about the project assessment.

The Specific Level Notes below provide suggestions for using **Master 1 Project Rubric** to assess student work on the Unit 4 project.

Score/Level	Specific Level Notes
5 (Standard of Excellence)	• provides a complete and correct response with clear and concise communication; may include a minor error that does not affect the understanding of the overall project; may include weak communication in no more than one calculation or part
4 (Above Acceptable)	Demonstrates *one* of the following: • provides a complete response to all parts of the project, demonstrating a thorough understanding of concepts; may have weak or missing justification in no more than two parts; includes good communication; demonstrates a clear understanding of the meaning of the solution to answer contextual problems and is able to use solutions in making meaningful predictions • provides a complete response with one error that is carried through correctly (i.e., an incorrect system is written for one context, solved, and interpreted correctly for that context); includes good communication that addresses which strategy for solving a system may be the best in a given context • provides a response that addresses all parts of the project but is difficult to follow and lacks organization; does not provide support for the costs associated with retrofitting; includes good communication
3 (Meets Acceptable)	Demonstrates *one* of the following: • makes correct initial start to all sections of the project • correctly completes questions in the project; solves consistently, using two methods; demonstrates a basic understanding of the meaning of the intersection point or the solution to a system; communication is generally correct but may include some errors or omissions; can consistently write the system of equations from a context; includes good communication with some connections • provides answers to all parts without supporting work or justification; weak or missing presentations links
2 (Below Acceptable)	• makes initial starts to various sections of the project; provides some correct links • draws a distance-versus-time graph, with or without technology, and solves the system graphically, but has difficulty interpreting the solution • is able to describe changes in a population from a table of values • demonstrates the ability to isolate a variable and use this in solving a system but has difficulty with interpreting the solution • demonstrates some success in writing equations from contexts • demonstrates a method for solving systems of equations with relative consistency, can correctly identify the solution but has difficulty with interpretations or explanations • includes some communication
1 (Beginning)	• makes initial starts to various sections of the project but is unable to carry through or link concepts together • draws a distance-versus-time graph given the equations, with or without technology, using appropriate scales • is able to describe the changes in a population from a table of values; communication is weak • demonstrates the ability to isolate a variable but has no success in solving the system • demonstrates limited to no success in writing equations from a context • attempts to use various methods to solve systems but is unable to demonstrate one method with any consistent success • includes little or no communication