Gold Seal Lesson:

Copernicus Education Gateway

Author(s): ***Samuel Perez Jr.***			***Lesson Title:*** ***Water Conservation***			
Grade Span			***ICLE Application Model***			
K-4	***5-8***	***9-12*** ***xx***	***A***	***B***	***C***	***D*** ***xx***

Instructional Focus:

Algebraic Concepts and Relationships: Students use algebraic methods to investigate, model, and interpret patterns and functions involving numbers, shapes, data, and graphs in a problem-solving situation. Students evaluate and 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.
Statistics: Students use statistics and probability to analyze given situations and the results of experiments. Students communicate the reasoning used in arriving at a conclusion.
Tools and Technology: Students apply a variety of problem-solving strategies to investigate and solve problems from across the curriculum as well as from practical applications.
Writing: Students write for a variety of purposes and audiences with sophistication and complexity appropriate to the grade level.

Performance Task

Schools, like other institutions, must allocate moneys for particular programs and projects. One such program would be the maintenance of lawns, trees, shrubs and flowers. Mr. Barnes, the *Grounds Manager* for a particular school, has noticed recently that some grassy areas are very dry, while others areas are so soaked that some students call them the "marsh". He needs to determine how to water all areas in a manner that allows for successful growth and proper maintenance of the area. Mr. Barnes is concerned with the conservation of water, realizing that a plan needs to be developed that will provide for proper maintenance of the grounds while, at the same time, optimizing water usage. He must also be concerned with money, since the money provided in his budget is not unlimited.

Your task is to develop a plan for Mr. Barnes. You can use any available resources that you feel will be helpful to you. When you have completed your research and plan of action, write a memo to Mr. Barnes detailing all aspects of your plan. Include all rationale that will support your plan.

Note to teacher: This assignment can be used to identify water conservation in areas in your school, community or surrounding companies. Students make extend this project by examining other factors. For example, some students may identify growth rates for certain grass types as well as appropriate grasses for different areas of the country. The project could involve other subject areas.

ICLE Essential Skills

Perform ***operations with signed*** (positive and negative) ***numbers***, including decimals, ratios, percents, and fractions. (m1)
Understand the correct order of operations for performing algebraic computations. (m8)
Find the ***solution of linear equations and inequalities*** where the variable appears on both sides and in which one or both sides must be simplified before solving the equation (e.g., solve x+2(x-3) = -4x+5 for x). (m35)
Understand the characteristics of ***parallel, perpendicular, and intersecting lines***. (m2)
Understand the characteristics and terminology of ***angles,*** e.g., degree measure, classification of angles by measure (acute, right, obtuse, and straight), supplementary and complementary angles, and vertical angles. (m4)
Compute the ***perimeter and area of two-dimensional figures***. (m13)
Understand the characteristics of ***algorithms*** and how they are used for finding the greatest common denominator of two numbers and the solutions of quadratic equations. (m62)
Understand the best procedures for statistical ***data collection, organization, and display*** including making estimates

and predictions and drawing inferences**.** (m5)

Present information in a well-organized fashion that will be clear to the target audience. (ela11)

Identify, collect, and/or select pertinent information while reading. (ela5)

Scoring Guide:

TEAMWORK:
3 Points:
The student participates in all parts of the task without help. Student collects data and draws graphs, charts, tables accurately without help. Materials are turned in on time and neatly drawn with all pieces labeled. Student cooperates well with everyone.

2 Points:
The student participates in some parts of task. Student needs help with data collection and drawing of graphs. Materials are turned in late and not neat with missing components.

1 Point:
The student participates very little and fails to turn in assignments on time. Student is uncooperative.

0 Points:
The student did not attempt task.

PROBLEM SOLVING:
3 Points:
The students work shows evidence of a good plan for solving the task problem. All steps are presented.

2 Points:
The student shows evidence of an adequate plan for solving the task problem. Some steps are missing.

1 Point:
The student has little evidence of a plan and work is of poor quality. Steps are missing.

0 Points:
The student did not attempt task.

ACCURACY OF PLAN:
3 Points:
All calculations are correct and completely solved. All steps are justified.

2 Points:
Most calculations are correct and partially solved. Most steps are justified.

1 Point:
Many inaccuracies exist and calculations are incorrect. Steps are not justified.

0 Points:
The student did not attempt task.

QUALITY OF COMMUNICATION:
3 Points:
Communication is appropriate and done in a professional manner. Memo is neat and contains no errors.

2 Points:
Communication is adequate and is done in a semi professional manner. Memo is fairly neat with a few errors.

1 Point:
Communication is not acceptable. Memo is messy and/or missing.

0 Points:
The student did not attempt task.

Keywords

English Language Arts	Mathematics	Science
Reading In context Research Technology	**Algebra** Algebraic operations Budget Computation Cost Analysis Equations Estimation Functions Graphs Math in daily life Tables Technology	**Earth Science**
Writing Organization Proposal Technical writing	**Geometry** Angles Area Calculators Geometric shapes Geometry in daily life Perimeter Problem solving Technology	**Life Science**
Communications Communication Technology	**Statistics** Data Analysis Graphs Measurement	**Chemistry**
Literature	**Calculus**	**Physics**
Other Memo writing Cooperation with other students Report writing Map identification	**Trigonometry**	**Other**
	Other Order of operation Operations with signed numbers	