Garden Plot

By Karen Johnson

Suggested grade level(s)
Algebra II

Time
30 minutes

Objective(s)
• Help students with area, perimeter and quadratic equations

Materials
• Graph paper

Alaska Standards
MA.2
MA.4
M4.3.2
M4.3.4
M4.4.1
M4.4.2

Terms to Define
Perimeter
Area
Integer
Domain
Range

Introduction

Looking ahead to spring, families will start to think about planting a garden. Does your family have a garden? Why plant a garden in Alaska? What challenges does gardening in Alaska present? What vegetables would you plant in your garden? What shape and size garden is best? Students will investigate the relationship between perimeter, length, width and area of possible garden plots. They will explore the relationship between length and area graphically.

Background for Teachers

Knowledge of perimeter and area of a rectangle and quadratic equations is important.

Introduction for students

Students should be familiar with finding perimeter and area of a rectangle, plotting points on a coordinate grid, and writing expressions and quadratic equation.

Lesson or Activity (s)

Garden Plot

John was talking with his neighbor, Tom, who just finished putting up a fence around his yard. Tom had 57 linear feet of fence leftover. Since John wanted to put in a garden this spring, he got the leftover fencing from Tom. Now John has to decide what size of garden he should have. He will buy a 3 foot gate for the garden. Using your knowledge of perimeter and area, find as many different sets of dimensions that John could have for his garden using all the fence he got from Tom. Use integers for dimensions.

Length	Width	Area
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Garden Plot

Other Activities
Students could plan out their garden using their chosen dimensions. They could include vegetables, flowers, and fruit. Each student could be given a different number of linear feet for the problem. (hint: dimensions for a square have the largest area)

Other Activities for Older or Younger Students
Students could build models of the garden plots and visually see the variety of areas with the same perimeters of fence. The garden plot could be put in the corner or side of a fenced yard.

Discussion Points
Why is the relationship quadratic? Which 2 quantities would result in a linear relationship? Is this shape the best for a garden?

Choose the option you think is best and explain why.

If l = length of the garden, write an expression to find the width:_____
Write an expression involving the length (l) to find the area of the garden:_____
Using your values for length and area, plot the ordered pairs (length, area) on graph paper.
What are the domain and range for the garden problem?
  Domain_____
  Range_____
Would the best model be linear, quadratic or exponential?
Write the equation relating area (A) and length (l).
  A = _____

Other related AITC Lessons
Build A Farm
Work & Farm

Karen Johnson is a teacher in the Fairbanks North Star Borough School District. This lesson written as part of the Alaska Agriculture in the Classroom Educator Institute.