

## Lesson: Mathematics 4-6 Area Measurement & Fractions



# Farmer McGregor's Garden

## Overview

### Objective

Students will read chart/map of Farmer McGregor's Garden and solve problems related to fractions and finding area.

### Academic Content Standards

*Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another.*

*Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools, and technologies.*

- ❖ Ohio Academic Content Standards for Mathematics: #1, Number, Number Sense and Operations, Benchmarks B and J (Grade 4); Benchmark B and I (Grades 5,6).
- ❖ Ohio Academic Content Standards for Mathematics: #2, Measurement, Benchmarks A and D (Grade 4); Benchmarks A, C and E (Grades 5,6).
- ❖ National Council of Teachers of Mathematics' Standards for School Mathematics: #1 Number and Operations Standard; #2 Measurement Standard.

### Materials

- Chart/map of Farmer McGregor's Garden
- Pencil
- Handout, "Farmer McGregor's Garden"

### Vocabulary

- Percent
- Fraction
- Area
- Square meters

### Technology

Spreadsheet software to construct a data table with formulas for student use to check their work and answers.

## Lesson

### Orientation Activity

Explain to the students that Farmer McGregor has farmers that live on each side of his farm and across the street. Farmer McGregor has difficulties when he talks with his neighbors about their farms. One neighbor refers to McGregor's garden in square units, while another neighbor refers to tenths and hundredths, and a third neighbor refers to percentages. Farmer McGregor wants to compare his garden to his neighbors, but he needs some help making some important calculations first.

### Learning Activity

This is an activity that could be completed in several ways. If the students already have knowledge of percentages, fractions and using fractions to calculate decimals then they may work individually or in small groups. Students will check with teacher after completing each section to verify and confirm correct understanding of the task. If students are not familiar with these concepts, then it is a good idea to work through the problems as a class. Work out the first few problems in each section together. Then allow for students to complete the last few on their own. Check answers as a class. Stress the emphasis between the relationships of fractions to decimals to percentages and vice versa, with either strategy selected for completion of the lesson.

### **Evaluation and Follow-Up**

#### Assessment Tools and Methods:

Teacher will check each student's/group's work after completing each section of the lesson.

Teacher will observe students while they solve the problems among themselves as well as during any class discussion.

## Handout

# Farmer McGregor's Garden

The garden is divided into 25 equal sections. Each section is labeled below. To easily identify each group of vegetables, color each square using the following labels:

corn = yellow  
beans = green  
tomatoes = red  
cucumbers = blue

pumpkins = orange  
peas = gray  
onions = white  
wheat = brown

Now answer the questions about the garden.

40 meters	Corn	Corn	Beans	Pumpkins	Wheat
	Corn	Corn	Beans	Pumpkins	Wheat
	Corn	Corn	Tomatoes	Peas	Wheat
	Corn	Corn	Tomatoes	Peas	Wheat
	Corn	Corn	Cucumbers	Onions	Wheat

## **Measurement and Area**

(Hint: area = length x width)

What is the length of the garden in meters? \_\_\_\_\_

What is the width of the garden in meters? \_\_\_\_\_

How many square meters are in one section if the garden? \_\_\_\_\_

How many square meters are in the entire garden? \_\_\_\_\_

How many square meters of corn are in the garden? \_\_\_\_\_

How many square meters of tomatoes are in the garden? \_\_\_\_\_

How many square meters of beans are in the garden? \_\_\_\_\_

How many square meters of pumpkins are in the garden? \_\_\_\_\_

How many square meters of wheat are in the garden? \_\_\_\_\_

How many square meters of onions are in the garden? \_\_\_\_\_

How many square meters of peas are in the garden? \_\_\_\_\_

How many square meters of cucumber are in the garden? \_\_\_\_\_

## **Fractions**

(Hint: denominator should be the total number of sections in the garden)

What fractional value of the garden is corn? \_\_\_\_\_

What fractional value of the garden is tomatoes? \_\_\_\_\_

What fractional value of the garden is beans? \_\_\_\_\_

What fractional value of the garden is pumpkins? \_\_\_\_\_

What fractional value of the garden is wheat? \_\_\_\_\_

What fractional value of the garden are onions? \_\_\_\_\_

What fractional value of the garden is peas? \_\_\_\_\_

What fractional value of the garden is cucumbers? \_\_\_\_\_

**(Make sure that all fractions are reduced to their lowest terms!)**

## **Decimals**

Use the fractions above to compute the decimal value of each vegetable in the entire garden. (Hint: divide the numerator by the denominator)

What is the decimal value for the amount corn in the garden? \_\_\_\_\_

What is the decimal value for the amount tomatoes in the garden? \_\_\_\_\_

What is the decimal value for the amount beans in the garden? \_\_\_\_\_

What is the decimal value for the amount pumpkins in the garden? \_\_\_\_\_

What is the decimal value for the amount wheat in the garden? \_\_\_\_\_

What is the decimal value for the amount onions in the garden? \_\_\_\_\_

What is the decimal value for the amount peas in the garden? \_\_\_\_\_

What is the decimal value for the amount cucumbers in the garden? \_\_\_\_\_

## **Percent**

Use the decimals above to compute the percentage of each vegetable in the entire garden. (Hint: move the decimal point)

What is the percentage of corn in the garden? \_\_\_\_\_

What is the percentage of tomatoes in the garden? \_\_\_\_\_

What is the percentage of beans in the garden? \_\_\_\_\_

What is the percentage of pumpkins in the garden? \_\_\_\_\_

What is the percentage of wheat in the garden? \_\_\_\_\_

What is the percentage of onions in the garden? \_\_\_\_\_

What is the percentage of peas in the garden? \_\_\_\_\_

What is the percentage of cucumbers in the garden? \_\_\_\_\_

**What relationships can you find between fractions, decimals and percentages?**