

## What is The Best Path: Lesson Plan (6th Grade)



### Objective:

- Use mathematical modeling to build the best delivery path

### Materials:

- Which Path to Take? Activity Sheet

### Instructional Plan:

The Letter Carrier problem draws on students' prior experiences:

A letter carrier needs to deliver mail to both sides of a street. What path should she choose?

Put the students into groups of two to three and hand out the Which Path to Take Activity Sheet. Using the images on the sheet create at least two different paths for the mail carrier to take. After creating those paths, compare them and decide which one is best. Students should discuss the meaning of 'best' here.

After the students have compared paths, let the students attempt to find a path using variables. Makes sure to discuss assumptions.

### Tennessee Mathematics Standards:

Understand solving an equation or inequality is carried out by determining if any of the values from a given set make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

Interpret and write an inequality of the form  $x > c$  or  $x < c$  which represents a condition or constraint in a real-world or mathematical problem. Recognize that inequalities have infinitely many solutions; represent solutions on inequalities on number line diagrams.

Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

Solve real-world and mathematical problems by writing and solving one-step equations of the form  $x + p = q$  and  $px = q$  for cases in which  $p$ ,  $q$ , and  $x$  are all nonnegative rational numbers.

Adapted from Czocher, J., and D. Moss. 2017. Mathematical modeling: Are prior experiences important? *Mathematics Teacher* 110: 654-660.

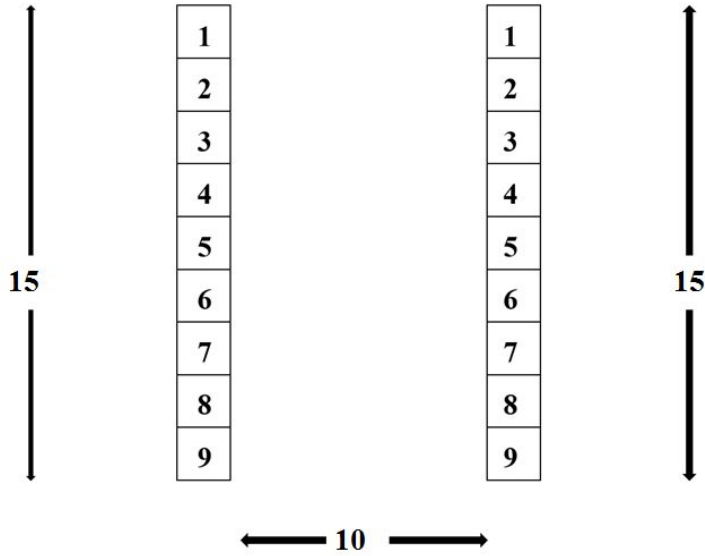
Adapted by: Cameron Cook, Suzanne Lenhart, Virginia Parkman, and Greg Wiggins

Name: \_\_\_\_\_

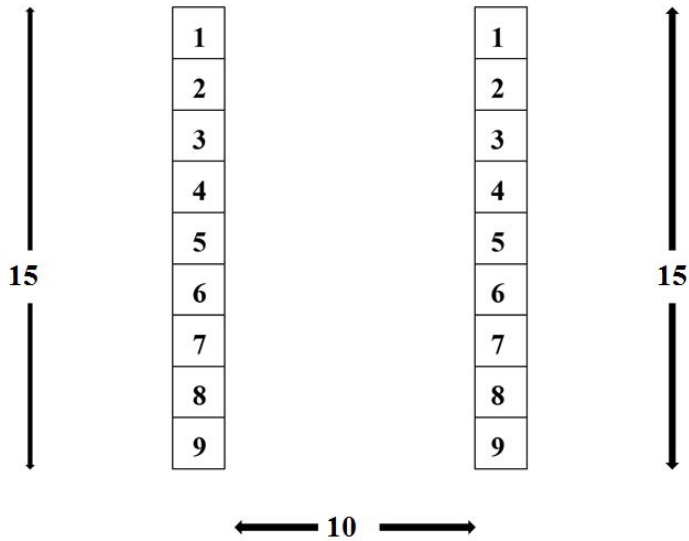
**Which Path to Take?**

1.)A mail carrier has added a new street to her route. This street consists of nine mail boxes on each side that is 15 feet long and 10 feet wide. Find the best path.

**1st Path:**



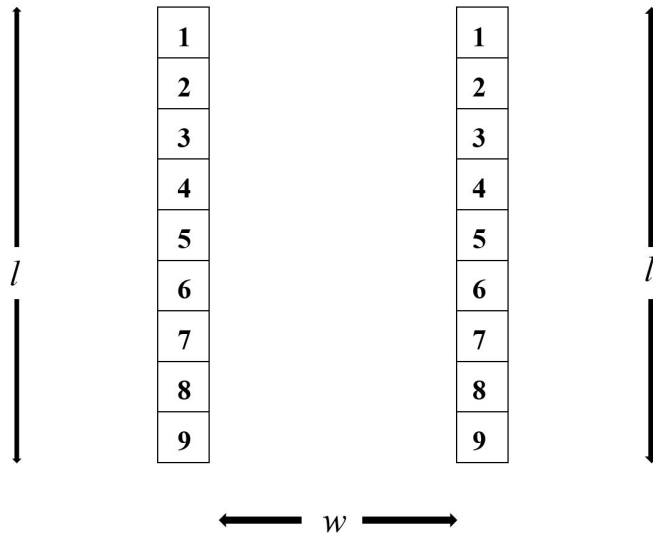
**2nd Path:**



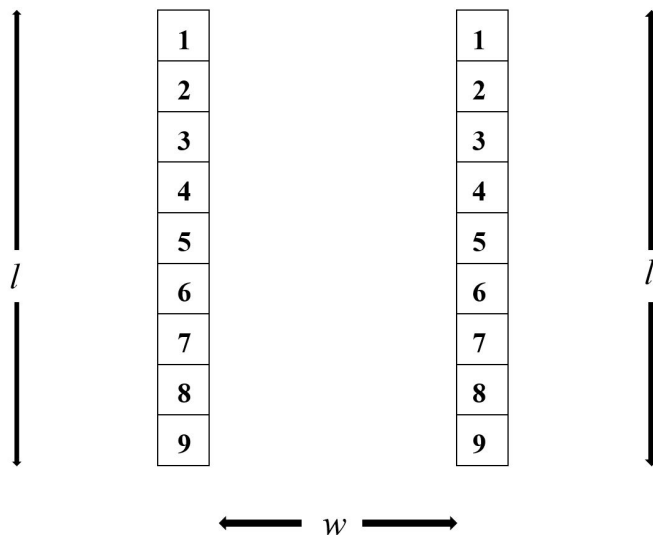
**Compare the paths:**

2.) Now, the mail carrier has a new route, but the carrier has less information about the length and width of the street. They know that there are still nine mailboxes, but the length is the variable  $l$  and the width is the variable  $w$ . Using knowledge from the previous new path, create two paths for the mail carrier and determine the best path.

**1st Path:**



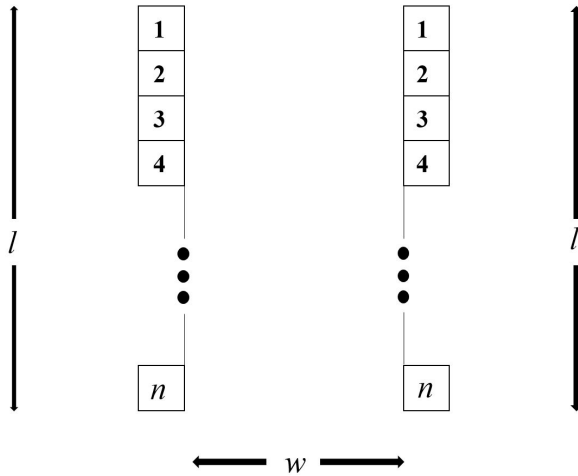
**2nd Path:**



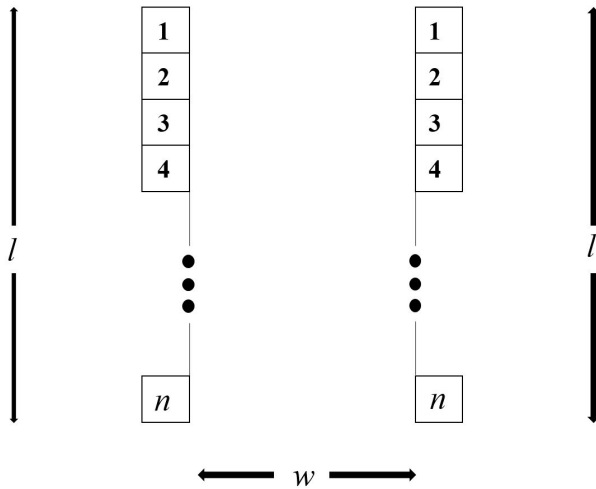
**Compare the paths:**

3.) Now, the mail carrier has a new route, but the carrier has less information about the length and the width of the street and how many mailboxes are on the street. We know that the length is the variable  $l$ , the width is the variable  $w$ , and the amount of the mailboxes is the variable  $n$ . Using knowledge from the previous new path, create two paths for the mail carrier and determine the best path.

**1st Path:**



**2nd Path:**



**Compare the paths:**