

**Course Title: Math: Mastering Multiplication, Division, Addition, Subtraction, Concepts of Fractions and Decimals for Elementary and Middle level Math Programs. (Requires \$69 Math Kit Purchase)**

**Instructor:** Paul Lawrence

**Length:** 15 hours

**Dates:** Rolling admissions

**Prerequisites:** Bachelor Degree

**Number of credits:** 1

**Course Description:**

In the first of a three-part session on mastering multiplication and division facts, Paul Lawrence explores how teachers can use arrays and groups of things as effective strategies to help students understand the concept of multiplication. As in previous presentations, Lawrence leads teachers through several exercises that teachers can use with their students. These exercises help ensure that students grasp the concept of multiplication prior to their being asked to memorize and recall multiplication facts. In doing so, he carefully moves from the concrete to the iconic, and then the symbolic. He reminds us that it is important to be sure that students have a firm grasp of a math concept before asking them to memorize the facts related to that concept. And he also stresses that importance of using more than one approach to reach the same end—mastery of the concept. That way, he suggests, you will be sure that all students will master the concept.

Paul Lawrence explores how teachers can help student understand basic addition and subtraction of whole numbers. This topic is covered in two parts. In this, the first of the two parts, the presenter demonstrates how connecting cubes, geoboards, and various templates can be used to help students visualize addition with double-digit whole numbers. He illustrates how using these techniques can also be an effective way of introducing, without calling attention to, basic algebraic concepts. These techniques lay a solid foundation for helping students develop the ability to use mental math to solve addition problems involving double-digit whole numbers. Subtraction is considered in part two of this topic.

He goes on to explore how teachers can help student understand basic addition and subtraction of whole numbers. This topic is covered in two parts. In this, the second of the two parts, the presenter introduces several games that can be used to help students master addition and subtraction with whole numbers—the Win A Flat, the Lose a Flat game, and the Column Addition game. He illustrates how these games help students understand the concepts that underlie addition and subtraction of whole numbers and can also help develop their ability to estimate answers to math problems. Finally, he offers several strategies that students can use when solving mixed sets of multi-digit addition and subtraction problems.

**Objectives:**

1. Knowledge –at the end of this course, the student will be able to understand:
  - a. The importance of teaching multiple strategies for solving math problems
  - b. How to use connecting cubes to teach addition and subtraction facts
  - c. How to use arrays to teach multiplication
2. Skills –after this course, a student will be able to:
  - a. Teach double digit addition and subtraction using base ten blocks
  - b. Utilize games as teaching tools
  - c. Help students develop their capacity to estimate answers to math problems
3. Dispositions – after this course, a student will appreciate:
  - a. The importance of using multiple strategies when teaching math concepts
  - b. The importance of moving from the concrete to the iconic and then the symbolic when helping students master math concepts
  - c. How to help students learn to use mental math with basic addition and subtraction up to double digits

**Session Topics (8):**

Mastering Multiplication and Division Beyond Facts: Part 1	Paul Lawrence
Mastering Multiplication and Division Beyond Facts: Part 2	Paul Lawrence
Concepts of Fractions and Decimals: Part 1	Paul Lawrence
Concepts of Fractions and Decimals: Part 2	Paul Lawrence
Concepts of Fractions and Decimals: Part 3	Paul Lawrence
Addition and Subtraction of Fractions with Same and Compatible Denominators	Paul Lawrence
Addition and Subtraction of Fractions with Non-Compatible and Overlapping Denominators	Paul Lawrence
Multiplication of Fractions	Paul Lawrence

**Instructor Overview:**

**Paul Lawrence**, a retired administrator/teacher, has been in public education for over 34 years. He believes that every student has the potential to learn and can be successful. His passion is to share ideas he has learned about teaching and learning with other professionals throughout the United States. To help him meet this goal, he has published a book titled *Good Connections for Testing* and offers highly energized, professional, customized workshops for districts and schools throughout the United States. Paul is on the road approximately 200 days per year and is booked up to a year in advance.

### **Methods of Instruction:**

Methods of instruction will include

- Individual sections (8) (15 hours)
- Pre assessments (8)
- Graded post assessments (8)
- Video lectures (8) Polling questions - included in videos
- Study guides (8) (60 to 100 pages)
- Handouts
- Final Project

**All steps listed under each topic must be completed to receive credit for the course. No partial credit will be given.**

**Students must earn a minimum of 70% to pass the course.**

### **Texts (included in program)**

- Study guide provided in the program (200 pages)

### **Assignments**

- Pre assignments (40)
- Post assignments (64)
- Final project (1)

### **Percentage of Course Credit**

- Graded post assessments      70%
- Final Project                      30%

**Due dates of major assignments, projects, and examinations:** Online self-running programs can be started and completed at participants' own leisure within two months from the day they begin the course. Participants must complete and turn in the final within two weeks of completing the course.

### **Grading criteria/system and evaluation activities:**

A course administrator will be reviewing students' answers and providing feedback. Students will be evaluated on their creativity and ability to incorporate techniques from the lectures into examples, lesson plans, and the final project.