

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 semester hour

Course Description:

In this hands-on, discovery-based mathematics course, participants will learn to help their students move from the concrete to the iconic to the symbolic. They will study how to assure that comprehension precedes memorization of addition, multiplication, and division facts, using arrays and groups of objects as strategies to assist understanding. While mastery of the concept is the end of every pursuit, participants will learn many approaches to reach that end, so that they can assist students with different learning styles and modalities. An assortment of math games will enliven participants' toolkits while engaging students as only games can do, even as they master their mathematics.

Objectives:

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

Units:

1. Mastering Multiplication and Division Beyond Facts: Part 1
2. Mastering Multiplication and Division Beyond Facts: Part 2
3. Concepts of Fractions and Decimals: Part 1
4. Concepts of Fractions and Decimals: Part 2
5. Concepts of Fractions and Decimals: Part 3
6. Addition and Subtraction of Fractions with Same and Compatible Denominators
7. Addition and Subtraction of Fractions with Non-Compatible and Overlapping Denominators
8. Multiplication of Fractions

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:

- Video lectures and PowerPoint presentations
- Short answer quizzes
- Graded post assessments
- Final

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 60% to pass the course.

Percentage of Course Credit

- Graded post assessments and short answer quizzes 40%
- Final Project 60%

KDS Rubric for GA courses (passing requirements: 60 points):

- A: 90 - 100 points
- B: 80
- C: 70 points
- D: 60 points
- F: Fewer than 60 points

Component	Unsatisfactory (10 points)	Basic (20 points)	Proficient (30 points)	Distinguished (40 points)
Critical thinking post-work	<u>Critical thinking post-work:</u>	<u>Critical thinking post-work:</u>	<u>Critical thinking post-work:</u>	<u>Critical thinking post-work:</u>
And	0-40% correct	60% correct	80% correct	100% correct
Short answer quizzes	<u>Short answer quiz:</u> -Participant included no content from the course in his or her responses	<u>Short answer quiz:</u> -Participant included some content from the course, usually appropriate, in his or her responses	<u>Short answer quiz:</u> -Participant included appropriate content from the course in his or her responses	<u>Short answer quiz:</u> -Participant provided rich detail from the content of the course in his or her responses

	-Participant did not address the questions posed	-Participant answered the questions directly, not always fully	-Participant made thoughtful comments in direct response to the questions	-Participant made his or her responses to the questions personally meaningful
Final	<p>Unsatisfactory (30 points)</p> <p><u>Requirements of Assignment:</u></p> <p>-The assignment is substantially incomplete</p> <p><u>Form:</u></p> <p>- Plentiful grammatical mistakes -Confusing content -Missing documentation of sources</p> <p><u>Content:</u></p> <p>-No main idea and/or main idea is irrelevant to the assignment -No apparent paragraph organization -No supporting evidence for supporting ideas -No evidence in the lesson plan—in objectives, activities, or assessments—that</p>	<p>Basic (40 points)</p> <p><u>Requirements of Assignment :</u></p> <p>-Many requirements met, but a few pieces are missing, while others are underdeveloped— e.g., missing reflection or rubric or scant reflection and vague rubric</p> <p><u>Form:</u></p> <p>-Distracting grammatical errors -Confusing content -Inconsistent or missing documentation of sources</p> <p><u>Content:</u></p> <p>-The main idea is not clear in the opening paragraph -Relevance to main idea of supporting paragraphs is not always clear -Supporting ideas are only minimally illustrated by examples or quotes -The lesson plan does not show enough evidence</p>	<p>Proficient (50 points)</p> <p><u>Requirements of Assignment:</u></p> <p>-Participant has fulfilled all the requirements of the assignment.</p> <p><u>Form:</u></p> <p>-Participant has written a solid essay or lesson plan, including appropriate detail and in an interesting style.</p> <p><u>Content:</u></p> <p>-Essay is organized around a thesis or main idea, -Paragraphs are organized around ideas relevant to the main idea -Supporting ideas are evident, and usually include illustrating examples and/or quotes -The lesson plan</p>	<p>Distinguished (60 points)</p> <p><u>Requirements of Assignment:</u></p> <p>-All requirements gone beyond the requirements of the Assignment. e.g., inclusion of rubric, reflection, objective(s), etc.— whatever the directions indicate</p> <p><u>Form:</u></p> <p>-No grammatical errors -Eloquent expression -Proper citation of sources</p> <p><u>Content:</u></p> <p>-Essay is organized around a thesis or main idea -Paragraphs are organized around ideas relevant to the main idea -Supporting points are illustrated with examples and/or quotes -Lesson plan shows evidence of a deep understanding of</p>

	the learner comprehends the course content	that the learner understands the course content. Objectives and/or activities and/or assessments only vaguely apply to the course content	shows evidence of understanding of the course content in its objectives, activities, and/or assessments	course content and participant uses that understanding to create opportunities for students to authentically show what they have learned.
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