

Course Title: Math: Classifying, Ordering and Exploring Real, Negative, and Whole Numbers (Requires \$69 Math Kit Purchase)

Instructors: Paul Lawrence

Length: 15 hours

Dates: Rolling admissions

Prerequisites: Bachelor Degree

Number of credits: 1

Course Overview:

The course will provide teachers with easy-to-implement, well-sequenced activities that promote conceptual understanding and that relate concrete understanding to symbolic interpretation. Teachers will acquire techniques to assess all students' understanding of skills and concepts so that lessons can be adjusted to meet student needs and expand their understanding. Teachers will be provided with activities that require pattern recognition and descriptions with respect to operational procedures including whole numbers, fractions and decimals. Teachers will be able to utilize activities that provide creative practice with operational skills. They will be introduced to strategies that promote number sense, estimation strategies, and foundational understanding so that students can choose appropriate and efficient strategies to determine solutions.

Paul Lawrence also introduces the idea of a function machine. He explores ways that it can be used to help students understand prime factorization, greatest common factor, and least common multiples. He also demonstrates a variety of exercises that can be used to teach students divisibility rules.

Objectives:

1. Knowledge –at the end of this course, the student will be able to understand:
 - a. And diagnose students' level of understanding through a diagnostic tool,
 - b. How to use discovery based methods to help students understand the base ten number system, and
 - c. How to help students order and compare sets of whole numbers.
2. Skills –after this course, a student will be able to:
 - a. Make informed decisions in regard to students' understanding,
 - b. Identify and understand all the necessary components of developing number sense, and
 - c. Utilize the Communicator™.
3. Dispositions – after this course, a student will appreciate:
 - a. Learning discovery based methods that can substantially enrich math instruction,
 - b. A way to use math manipulatives to teach essential math concepts, and
 - c. Innovative strategies that can be used to help students grasp divisibility rules.

Session Topics (9):

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| Classifying, Ordering and Exploring Real Numbers: Part 1 | Paul Lawrence |
| Classifying, Ordering and Exploring Real Numbers: Part 2 | Paul Lawrence |
| Classifying, Ordering and Exploring Real Numbers: Part 3 | Paul Lawrence |
| Exploring Negative Numbers, Scientific Notation and Order of Operations | Paul Lawrence |
| Addition and Subtraction of Whole Numbers: Part 1 | Paul Lawrence |
| Addition and Subtraction of Whole Numbers: Part 2 | Paul Lawrence |
| Mastering Multiplication and Division Facts: Part 1 | Paul Lawrence |
| Mastering Multiplication and Division Facts: Part 2 | Paul Lawrence |
| Mastering Multiplication and Division Facts: Part 3 | 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.