

## Topics for Foundation of Number and Operations

MATH 2008

Georgia Highlands College

Updated Fall 2009

Textbook: Long, DeTemple, and Millman, *Mathematical Reasoning for Elementary Teachers*, 5<sup>th</sup> ed.

The following are the minimum number of sections suggested to be covered. The instructor is free to determine the order of coverage and the extent of coverage in the suggested sections. For instance, some instructors may prefer to cover chapter 1, sections 1 and 2 in their entirety before continuing to chapter 2. Others may wish to intersperse 1:1,2 in coverage of other chapters.

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| NCTM Principles & Standards | Have students explore the website, <a href="http://www.nctm.org">www.nctm.org</a> . Johnny Duke has a worksheet available for any instructors who would like to use it.  |
| GPS                         | Have students examine the Georgia Performance Standards at <a href="http://www.georgiastandards.org">www.georgiastandards.org</a> . This is part of the IC Assessment for this course.                                 |
| 1.1                         | An Introduction to Problem Solving   |
| 1.2                         | Polya's Problem-solving Principles   |
| 2.3                         | Addition and Subtraction of Whole Numbers (If the instructor does not cover 2.2, then at least introduce the whole numbers and representations of them while covering 2.3.)  |
| 2.4                         | Multiplication and Division of Whole Numbers   |
| 3.1                         | Numeration Systems Past and Present: At least cover Roman Numerals, the Indo-Arabic base-ten system with physical models to represent it. Coverage of other numeration systems such as Egyptian and Mayan is optional. |
| 3.2                         | Nondecimal Postional Systems: Cover bases 2, 5, and 12. Other bases are optional.  |
| 3.3                         | Algorithms for Adding and Subtracting Whole Numbers  |
| 3.4                         | Algorithms for Multiplying and Dividing Whole Numbers  |
| 3.5                         | Mental Arithmetic and Estimation   |

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| 4.1 | Divisibility of Natural Numbers                      |
| 4.2 | Tests for Divisibility                               |
| 4.3 | Greatest Common Divisors and Least Common Multiples  |
| 5.1 | Representations of Integers                          |
| 5.2 | Addition and Subtraction of Integers                 |
| 5.3 | Multiplication and Division of Integers              |
| 6.1 | The Basic Concepts of Fractions and Rational Numbers |
| 6.2 | Addition and Subtraction of Fractions                |
| 6.3 | Multiplication and Division of Fractions             |
| 6.4 | The Rational Number System                           |
| 7.1 | Decimals and Real Numbers                            |
| 7.2 | Computations with Decimals                           |
| 7.3 | Proportional Reasoning                               |
| 7.4 | Percent  |

If time is available, other sections that could be covered would include 2.1; 2.2; and 5.4. Also, one could cover numeration systems in 3.1 other than the ones suggested above.