

Chapter 3 Whole Numbers –(Basic Concepts – number facts)**Section 1**

Addition and subtraction of whole numbers in base ten and in other bases.

Section 2

Multiplication and division of whole numbers in base ten and in other bases.

For all four operations be able to **illustrate** on a **number line** and with **sets**.

Also know the **definitions** of subtraction and division and be able to use the definition of division to explain why you cannot divide by zero. [Note: “iff” means “if and only if”.]

$a - b = c$ iff $c + b = a$ & $a \div b = c$ iff $c \times b = a$ (where a, b, c are whole #s with $b \neq 0$)

Know the **properties** for addition and multiplication: Closure, Commutative, Associative, Identity, and Distributive. Be able to identify and give examples of each property.

Section 3

Ordering #, definition of less than ($a < b$ iff there exists a whole # c , such that $a + c = b$) and rules for working with **exponents**. Be able to explain why the rules for exponents work.

See power point lecture notes for section 3.3 in Blackboard Learning Module 3.

Chapter 4 Whole Numbers – (Later concepts – algorithms for multi-digit numbers)**Section 1**

Mental Math using properties, compatible numbers, compensation, left to right methods, special factors.

Estimation using front-end techniques (range, one-column with adjustment), rounding (truncate, 5 or more round up, round to compatible #s), and cluster estimation.

Section 2

Written algorithms for whole numbers in base ten. Concentrate on **standard** and **alternative** algorithms such as **lattice addition and multiplication, scratch addition, and subtract from the base**. Use this link for scratch addition <http://www.coolmath4kids.com/addition/>

Section 3

Standard and alternative algorithms for addition, subtraction, and multiplication in **other bases**. (Standard & lattice methods, and standard & subtract from the base.)

Chapter 5 Number Theory**Section 1**

Prime and composite numbers, divisibility tests and why they work. Create a test for a composite number based on its factors. Study summary of divisibility tests.

Section 2

Prime factorization of #s, least common **multiples** (LCM), and greatest common **factors** (GCF). Use a Venn Diagram with prime factors of numbers to illustrate how to find the LCM and GCF.

Word problem using LCM or GCF (in module 5, see worksheet of problems from 6th grade text).

Chapter 6 Fractions

Section 1 Basic meaning of a fraction using sets. When are two fractions equivalent?

Compare the size of fractions. Find a fraction between two other fractions.

Section 2 Addition and subtraction of fractions using LCM to find the common denominator.

Use **mental math** and **estimation** in addition and subtraction of fractions.

Chapter 6 Fractions (Continued)

Section 3 Multiplication and division of fractions.

Be able to **illustrate** multiplication with a diagram like those shown in the beginning of 6.3.

Know the **properties** for addition and multiplication of fractions: Closure, Commutative, Associative, Identity, and Distributive. New property is existence of multiplicative inverses. Use **mental math** and **estimation** in multiplication and division of fractions.

Online – Be sure to read the journal article and watch the video clips:

http://www.sci.sdsu.edu/CRMSE/IMAP/pubs/Reflections_on_Fractions.pdf

Chapter 7 Decimals, Ratio, Proportion, and Percent

Section 1 Basic meaning of decimals using expanded notation.

Theorem about when a fraction will be a decimal that terminates; this is based on prime factors of denominator of the simplified fraction.

Mental Math using properties, compatible numbers, compensation, & fraction equivalents.

Estimation using front-end techniques (range, one-column with adjustment), rounding, compatible #s, and fraction equivalents.

Study worksheet 7.1 in module 7 in the Blackboard Course.

Section 2 Written algorithms for +, -, x, and ÷ of decimal numbers. Concentrate on how the use of fractions can help in understanding the rules for arithmetic of decimal numbers.

Theorem about when a fraction will be an infinite repeating decimal.

Study worksheet 7.1-7.2 in module 7 in Blackboard.

Equation method for changing an infinite repeating decimal into its equivalent fractional form.

Scientific notation problems Set A # 5-11.

Section 3 A proportion is two equal ratios and uses the concepts of equivalent fractions.

“Scaling up or scaling down” is used for simple problems.

Solve a proportion using cross multiplication for more complex problems.

Be able to do a word problem using proportions. It helps to describe each ratio in the proportion using words.

Section 4 Be able to convert between equivalent fractions, decimals, & percents.

Mental math and **estimation** with percents.

Be able to do a word problem using percents, solving it with a simple algebraic equation, a proportion & show “gauge diagram”, see examples in text in section 7.4.

Review your notes and quizzes. Practice the concepts by doing problems from the chapter reviews. Check your understanding by doing the chapter tests as practice tests.

Use websites for these chapters from <http://people.uncw.edu/spikek/links.htm>