Number Systems in Elementary Mathematics

COURSE REVIEW

Chapter 1

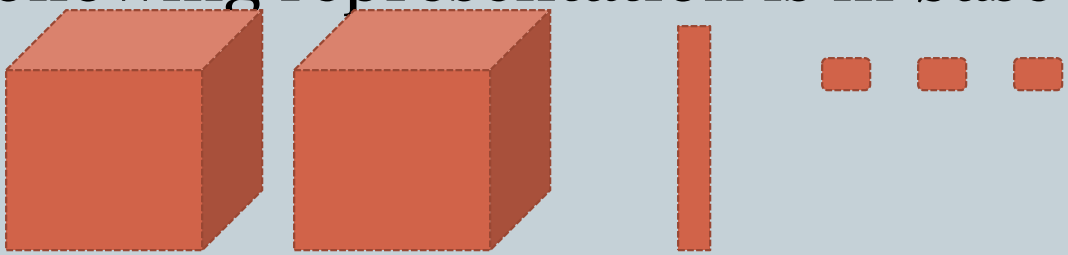
- What is a quantity?
  - What could be a “value” of a quantity
- Fundamentals of quantitative analysis
  - Ability to act out or draw a problem situation aids in the solution
  - Using objects (often rectangles) to represent quantities
- Word problems
  - Catching up problems
  - Coming together problems
- Conceptual vs procedural

Chapter 2

- Why we use the symbols we do for numbers
- The place value system
  - The difference between the following questions
    - What is in the tenths place? 2.6
    - How many tenths are in 2.6?
  - 408 is equal to how many tenths?
  - 408 is equal to how many hundredths?
  - 408 is equal to how many thousandths?
- Andrew's apple farm
  - Using this idea to convert from base 8 and base 10
- Bases other than ten
  - Counting in other bases
  - Base block diagrams
  - Adding / subtracting in other bases
  - Converting from base five into base ten
  - Difference between "number" and "numeral"
    - Number implies base 10
    - Numeral implies in base b

Do you remember…

- Convert 124.2_{five} into base ten.
- If the following representation is in base six



  - What is this base six numeral?
  - What is the number in base ten?
- What is $225_{seven} + 264_{seven}$
- If $542_b - 244_b = 264_b$, what is b?

Chapter 3

- Problem situations
  - Additive combination
  - Take away subtraction
  - Missing addend
  - Comparison subtraction (additive comparison)
  - Repeated addition (multiplication)
  - Fundamental counting principle
  - Fractional part of a quantity (multiplicative comparison)
  - Array/area model
  - Repeated subtraction (division)
  - Sharing equally
  - Missing factor view

Do you remember…

- The differences between
  - Take away subtraction
  - Missing addend
  - Comparison subtraction (additive comparison)
- The differences between
  - Repeated addition (multiplication)
  - Fundamental counting principle
  - Fractional part of a quantity (multiplicative comparison)
  - Array/area model
- The differences between
  - Repeated subtraction (division)
  - Sharing equally

Chapter 4

- Algorithms
  - Review the many ways that we can operate procedurally
- Base ten blocks and empty number line
  - Review the many ways that we can operate conceptually
- Student methods of solving things
- Analysis of student work

Chapter 5

- Mental math
  - Ability to explain your strategy
- Computational estimation
  - Know how to estimate effectively
  - If a problem says to estimate, estimate!
  - Mental percentage
  - Benchmark

Do you remember…

- Estimate 65% with a fraction
- Estimate 0.4819 with a fraction
- Estimate 1/3 with a decimal
- Estimate 1/9 with a percentage
- Mentally compute 52 x 400

Chapter 6

- Fraction
  - a/b , where a and b are whole numbers
  - Part whole characterization
  - Importance of equal parts
  - Infinite equivalent fractions means infinite ways to write any fraction
  - Simplest form
- Relationships between fractions, decimals, and percents
  - Converting fractions into decimals
  - Decimals into fractions
  - Rule between percents and decimals
- When will fractions have repeating or terminating decimals?
  - 2's and 5's rule
  - 9's and 99's rules

Do you remember…

- Will this fraction have a repeating decimal?
  - 1/3
  - 2/4
  - 3/20
  - 7/50
  - 7/15
- Write these decimals as a fraction in simplest form
  - 0.27
  - 0.125

Chapter 7

- Computing with fractions
  - Adding or subtracting fractions
    - Use the LCD
  - Multiplying
  - Dividing fractions
    - Flip and multiply rule
      - Examine how using the LCD is interesting with this rule
    - Repeated subtraction method
    - What does (a/b) ÷ (c/d) mean from the repeated subtraction viewpoint?
      - How many c/d are in a/b.
- Extending these ideas to word problems

Do you remember…

- A recipe calls for 1/3 cup of sugar. You have ½ cup of sugar. If you use all of your sugar, how many recipes can you make?
  - What is the operation?
  - Try solving with a diagram
  - Try solving using repeated subtraction
  - Try solving using algorithm
    - What is the referent unit for the 1/3? (1 cup of sugar)
    - What is the referent unit for the 1/2? (1 cup of sugar)
    - What is the referent unit for your solution? (1 recipe=1/3 cup of sugar)

Do you remember…

- Abel ate 1/3 of a pizza and saved the rest for later. His brother Cain snuck in and ate half of what Abel had left. How much of the original pizza did Cain end up eating?
  - What is the operation?
  - Try solving with a diagram
  - Try solving using algorithm
    - What is the referent unit for the 1/3? (1 pizza)
    - What is the referent unit for the 1/2? (Remaining pizza = 2/3 of a pizza)
    - What is the referent unit for your solution? (Original pizza = 1 pizza)

Chapters 8 and 9

- Multiplicative comparison
- Ratios
  - Describe a multiplicative comparison
  - Can be represented with fractions
    - Ratios and fractions are not always the same however
    - Candy bar sharing activity
  - “Proportional”
  - “Rate”
  - Unit ratio, unit rate