Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Mathematics	Course:	Intermediate PreAlgebra	Unit 5 Title:	Proportional Reasoning	Grade Level(s):	7
Assessed Trimester:	Trimester 2	Pacing:	15-18 Days	Date Created:	5/31/2014	Last Revision Date:	6/18/2014

Course Understandings: *Students will understand that:*

A. There are multiple strategies and representations that can be used to solve real world problems involving rational numbers.
C. Proportional reasoning and percents can be used to solve real world problems.
G. There are appropriate uses for various technologies and that limitations may exist with them.

DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals

Minnesota State/Local/Technology Standard(s) addressed (2007):

- **Standard (7.2.2.#):** Recognize proportional relationships in real-world and mathematical situations; represent these and other relationships with tables, verbal descriptions, symbols and graphs; solve problems involving proportional relationships and explain results in the original context.
  Benchmark:
  7.2.2.1 Represent Proportional Relationships Represent proportional relationships with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. Determine the unit rate (constant of proportionality or slope) given any of these representations.
  7.2.2.2 Problems involving Proportional Relationships Solve multi-step problems involving proportional relationships in numerous contexts.
  7.2.2.3 Proportions & Reasonableness Use knowledge of proportions to assess the reasonableness of solutions.

- **Standard (7.1.2.#):** Calculate with positive and negative rational numbers, and rational numbers with whole number exponents, to solve real-world and mathematical problems.
  Benchmark:
  7.1.2.5 Use proportional reasoning to solve problems involving ratios in various contexts.

Transfer

Students will be able to independently use their learning to: (product, high order reasoning)

- Apply proportional reasoning to solve a variety of real world problems.

Meaning

Unit Understanding(s):	Essential Question(s):
Students will understand that: ● You can use ratios to write proportions representing mathematical and real-world situations (part to part, part to whole). ● Proportional relationships can be represented with a table. ● Two equivalent ratios represent a proportional relationship (including tabular representations). ● Many real world problems can be solved using proportional reasoning, including percent of a number, percent change, and proportional rates. ● Knowledge of proportions can determine the reasonableness of a solution.	**Students will keep considering:** ● How can given comparison data be used to make predictions about unknown quantities? ● When and why do I use proportional comparisons? ● How does comparing quantities describe the relationship between them? ● How can you use rates to describe real world problems? ● How can visual representations help you understand a proportional situation? ● How can you use a proportion to solve real life problems? ● How can you use tables to solve proportions ● How can you use models to estimate percent problems?

	• When would you use percent of change? • How does explaining my process help me to understand a problem's solution better?

Acquisition

Knowledge - Students will: • Differentiate mathematical characteristics of proportional thinking from nonproportional contexts. • See relationships as as proportional relationships • Use ratios accurately • Identify unit rate • Understand percents are a ratio out of 100 **Reasoning - Students will:** • Use estimation to determine if an answer is reasonable. • Translate from one representation of a proportional relationship to another. • Explain how to set up a proportion given real-world context.	**Skills - Students will:** • Scale values up and down • Make tables that represents proportional relationships. • Set up a proportion given a real-world scenario. • Solve proportions involving tax, tip, discount, and percent of change, etc.

Common Misunderstandings • Increasing by 20% is different than increasing by 20. • Forgetting to check the reasonableness of a solution. • The difference between 5% of an item (tip) and 105% of an item (total+tip) • Students incorrectly enter the percent into the calculator instead of the decimal value. • Students want to use addition to get equivalent values, not multiplication.	**Essential new vocabulary** • Proportion • Proportional • Scale Factor