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| **Representative TN State Curriculum Standards**  *4th Grade*  GLE:  GLE 0406.1.1 Use mathematical language, symbols, and definitions while developing mathematical  reasoning.  GLE 0406.2.2 Develop fluency with multiplication and single-digit division.  State Performance Indicators:  SPI 0406.1.4 Compare objects with respect to a given geometric or physical attribute and select  appropriate measurement instrument.  SPI 0406.2.11 Solve problems using whole number multi-digit multiplication.  *6th Grade*  GLE:  GLE 0606.2.3 Understand and use ratios, rates and percents.  GLE 0606.4.2 Use the concepts of translation, rotation, reflection, and symmetry to understand  congruence in the plane.  State Performance Indicators:  SPI 0606.2.2 Solve problems involving the addition, subtraction, multiplication, and division of mixed numbers.  SPI 0606.4.1 Identify, define or describe geometric shapes given a visual representation or a written description of its properties.  SPI 0606.4.2 Find a missing angle measure in problems involving interior/exterior angles and/or their sums. | |
| Time: 15 Minutes | While reading the literature book, “Counting on Frank”, we will discuss the mathematical concepts of counting, size comparison, and ratio:   * Through-out the read-aloud, the class as a whole and individually, will complete a DLTA (Direct Learning Thinking Activity). * The DLTA will then be discussed as a class. * To carry out the concepts of ratios, we will begin our ratio activity. Ask the students to locate their Frank and Whale manipulatives on their desk. * While modeling the activity on the board, we will discuss part to part ratios and part to total ratios. How they differ and the different ways that they can be written. Than you can ask the students to invent a ratio of their own that they would like to share with the class.   Website sources:   * <http://www.det.nt.gov.au/__data/assets/pdf_file/0014/2633/CountingOnFrank.pdf> * <http://www.mathplayground.com/howto_ratios.html> |

**Virtual Manipulatives Time:** 8 Minutes

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| *Scale Factor X*  **http://www.mathplayground.com/ScaleFactorX/GameLoader.html**  Objective: The player is disguised as an avatar, must use mathematical reasoning to correct the scaliens who have been altering ratios, proportions, and scale factors. This activity is like a video game and teaching tool so it is hard for the student to realize that they are learning because they are just trying to make it to the next level all while gaining factual information. |
| *Ratio Martian*  http://www.arcademicskillbuilders.com/games/ratio-martian/ratio-martian.html  Objective: The martian is hungry and he only likes to eat ratios. The student will have to recognize the different ways that fractions can be represented in order to feed the martian. |

**Activities from the textbook**

**Materials needed: object cards, ratio tables, grid or dot paper, shoebox filled with capture-recapture objects, and recording sheets.**

1. Activity 18.1 Which Has More? 5 minutes
2. Activity 18.4 Different Objects, Same Ratios 5minutes
3. Activity 18.6 Using Ratio Tables 5 minutes
4. Activity 18.9 Scale Drawings 5 minutes
5. Activity 18.10 Capture-Recapture 5 minutes

**Lesson Plan (If time permits)**

***Measuring Up***

<http://illuminations.nctm.org/LessonDetail.aspx?ID=L510>

This lesson focuses on the “Golden Ratio”, a ratio of length to width that can be found in art, architecture, and nature can be related and true compared to the human body. The students have to measure and record to see if the “measure up” to the “Golden Ratio”.