**Task:** The Tale of the Scale **Grade Level:** Sixth

**Key APS Mathematics Standards:**

1. **Estimates** and **solves** problems involving fractions, and justifies the reasonableness of the solution.
2. **Solves** one-step equations using the concept of balance when quantities are added, subtracted, or divided to both sides of an equation.

| Level | Understanding | Strategies, Reasoning, & Procedures | Communication |
|---|---|---|---|
| **Novice** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |
| **Apprentice** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |
| **Practitioner** | **PROFICIENCY:**<br>**The student understands that:**<br>• S/he must determine the number of rafts needed for the rafting trip.<br>• S/he needs to make conversions, using algebraic concepts or fractions, to determine how many adults, teens & babies can safely travel on the rafts. | **PROFICIENCY:** The student uses an accurate and appropriate strategy to solve the task. S/he solves the problem using algebraic concepts or fractions to determine the equivalents of babies and rafts. (See 'Solutions' in Teacher Instructions).<br>**Sample Strategies:** The student converts everything to baby weight, because 24 babies can ride in 1 raft, so 11 adults = 66 babies; 5 teens = 15 babies; & 21 babies = 21 babies. 66 + 15 + 21 = 102 ÷ 24 = 4.25 Therefore they will need 5 rafts. | **PROFICIENCY:** The student can represent his/her work in a clear, organized manner, and uses appropriate fraction/decimal terms and symbols in his/her written explanation of how they determined the number of rafts needed to carry 11 adults, 5 teenagers, and 21 babies.<br>The student has created an efficient system (charts, t-tables, graphs, or pictures) for explaining their understanding of how they determined the number of rafts needed for the rafting trip. |
| **Expert** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |

**Task:** The Tale of the Scale **Grade Level:** Seventh

**Key APS Mathematics Standards:**

1. **Represents, describes,** and **analyzes** numerical patterns and linear relationships using tables, graphs, words, and standard algebraic notation.
2. **Explains** the relationship that can be expressed as part-to-part (e.g., 5 red apples, 3 green apples, expressed as 5/3).

| Level | Understanding | Strategies, Reasoning, & Procedures | Communication |
|---|---|---|---|
| **Novice** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |
| **Apprentice** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |
| **Practitioner** | **PROFICIENCY:**<br>**The student understands that:**<br>• S/he must determine the number of rafts needed for the rafting trip.<br>• S/he needs to make conversions, using algebraic concepts or fractions, to determine how many adults, teens & babies can safely travel on the rafts. | **PROFICIENCY:** The student uses an accurate and appropriate strategy to solve the task. S/he solves the problem using algebraic concepts or fractions to determine the equivalents of babies and rafts. (See 'Solutions' in Teacher Instructions).<br>**Sample Strategies:** The student converts all of the information in terms of the rafts and baby weight using ratios: 1 raft = 24 babies; 1 raft = 8 teens; & 1 raft = 4 adults, SO 21/24 (babies); 5/8 = 15/24 (teens); & 11/4 = 66/24 (adults). Therefore, 21/24 + 15/24 + 66/24 = 102/24 = 4 1/4. 5 rafts are needed to travel safely. | **PROFICIENCY:** The student can represent his/her work in a clear, organized manner, and uses appropriate fraction/decimal terms and symbols in his/her written explanation of how they determined the number of rafts needed to carry 11 adults, 5 teenagers, and 21 babies.<br>The student has created an efficient system (charts, t-tables, graphs, or pictures) for explaining their understanding of how they determined the number of rafts needed for the rafting trip. |
| **Expert** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |

Task: The Tale of the Scale Grade Level: Eighth

Key APS Mathematics Standards:

1. Identifies and models real-life situations using multiple representations.
2. Develops and tests strategies for solving multi-step equations.

| Level | Understanding | Strategies, Reasoning, & Procedures | Communication |
|---|---|---|---|
| **Novice** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |
| **Apprentice** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |
| **Practitioner** | **PROFICIENCY:**<br>**The student understands that:**<br>• S/he must determine the number of rafts needed for the rafting trip.<br>• S/he needs to make conversions, using algebraic concepts or fractions, to determine how many adults, teens & babies can safely travel on the rafts.<br>• S/he must represent their solution using multiple representations. | **PROFICIENCY:** The student uses an accurate and appropriate strategy to solve the task. S/he solves the problem using multiple representations of algebraic concepts and/or fractions to determine the equivalents of babies and rafts. (See 'Solutions' in Teacher Instructions).<br>**Sample Strategies:** The student converts all of the information in terms of the rafts and baby weight and realizes that the information can also be converted in terms of adult weight or teen weight. S/he must use 1 raft = 8 teens or 1 raft = 4 adults to finish the conversions. Using ratios to convert everything to teen weight:<br>5 teens = 5 teens; 1 teen = 3 babies so 7 teens = 21 babies; 2 teens = 1 adult so 22 teens = 11 adults; Therefore, 5 + 7 + 22 = 34 ÷ 8 = 4.25. 5 rafts are needed to travel safely. | **PROFICIENCY:** The student can represent his/her work in a clear, organized manner, and uses appropriate algebra and fraction/decimal terms and symbols in his/her written explanation of how they determined the number of rafts needed to carry 11 adults, 5 teenagers, and 21 babies.<br>The student has created an efficient system (charts, t-tables, graphs, or pictures) for explaining their understanding of how they determined the number of rafts needed for the rafting trip.<br>The student uses multiple representations to determine the accuracy of his/her answers. |
| **Expert** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** | **1.**<br>**2.**<br>**3.** |