We will choose appropriate models for a given situation, including tables, expressions, equations, tape diagrams, graphs, and area models. Accurate representations of ratios and rates are crucial. We will construct and critique arguments regarding these representations. In order to transfer them into ratios and rates, we will understand the context of a problem. This understanding will guide the choice of appropriate models.

Standards & Mathematical Practices

- Use unit rate to compare ratios (as rate per gallon, price per pound, etc.).
- Use ratios of two related quantities expressed in different units, examples to measure and analyze.
- Use the concept of a ratio and rate to solve problems.
- Use tables to find patterns, compare quantities, and express ratios.
- Use tape diagrams to compare quantities.
Essential Questions
- What kind of problems can I solve by using ratios?
- What is the difference between a multiplicative and an additive relationship?
- How are unit rates helpful in solving real-world problems?
- What information do I get when I compare two numbers using a ratio?

Math Practices being emphasized:
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Pre and Post Assessments
- Pre: Mixture of Common Core assessment questions and related word problems.
- Post: Common Core assessments

Key Concepts
- Ratio: a comparison of two quantities or measures using a given situation in a multiplicative relationship.
- Rate: a comparison of the measures of two different things or quantities; the measuring unit is different for each value.
- Unit Rates: a rate of one unit of the second quantity per unit of the first quantity.

Algorithms/Diagrams
- \( \frac{9}{8} \times 120 = \frac{9\times 120}{8} = \frac{1080}{8} = 140 \)
- \( \frac{4.6km}{2h} = 2.3km/h \)
- \( \frac{8}{5} = 1.6 \) per lb.
- \( \frac{4.99}{5} = 0.998 \) per lb.

Connections (Real World Applications)
- Recipes
- Sculptures
- Mechanics
- Video games
- Harry Potter
- Architects
- Surveyors
- Dentists
- Engineers
- Sales

Visual Models of Concepts
- Tape Diagrams
- Bar Models
- Rate Tables
- Double Number Lines
Predicting

Language Functions/Structures

Explain

We use two ratios in proportion problems to find.

The ratio ___ is equivalent to the ratio ___ because ___.

A ratio is different than a rate because ___.

<table>
<thead>
<tr>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>rational number</td>
</tr>
<tr>
<td>proportional reasoning</td>
</tr>
<tr>
<td>cross products</td>
</tr>
<tr>
<td>variables</td>
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<tr>
<td>quantity</td>
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<tr>
<td>unit cost</td>
</tr>
</tbody>
</table>

rate  proportion  scale  ratio
rate table  scaling  equivalent fractions  units
Tape diagram  percent

Focus and Motivation

Activity

Basketpaper Throw

Video (animation)

Study Jame - Ratio
Rate

Math Snacks - Ratio

Brainpop - Ratio

Focus and Motivation

Activity

Basketpaper Throw

Literature

Fourscore and 7: Investigating Math in American History by Betsy Franco

Only One by Marc Harshman

Fraction Action by Loreen Leedy

Math Curse by Jon Scieszka & Lane Smith

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