

Unit 3: Ratios & Proportional Relationships

Grade 7 Math

15 Class Meetings

Revised March 2026

Essential Questions

- When and why do you use proportional comparisons in the real world?
- How does comparing quantities describe the relationship between them?

Enduring Understandings with Unit Goals

EU 1: The proportional relationship between two quantities is a collection of equivalent ratios, related to each other by a constant of proportionality.

- Compare, analyze, and interpret proportional relationships between quantities in tables, graphs and equations.
- Utilize the constant of proportionality (unit rate) to identify proportional relationships.
- Evaluate unit rates in equations in the form of $y=kx$ and in graphs of proportional relationships as the ordered pair (l,r) .
- Evaluate two quantities ratios for their equivalency or straight line passing through the origin.

EU 2: Proportional relationships can be used to create drawing and models at differing scales.

- Compute areas and create geometric figures with scale drawings.
- Analyze scale drawings to find the scale factor and actual measurements.

Standards

Common Core State Standards:

- **7.RP.A.1:** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
- **7.RP.A.2:** Recognize and represent proportional relationships between quantities.
- **7.RP.A.2.A:** Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
- **7.RP.A.2.B:** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- **7.RP.A.2.C:** Represent proportional relationships by equations.
- **7.RP.A.2.D:** Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.
- **7.G.A.1:** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

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ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. Proportional Relations with Fractions

- Solve ratio and rate problems
- Apply part to part ratios
- Apply part to whole ratios
- Compute unit rates associated with ratios of fractions
- Compute ratios of lengths, areas, and other quantities measured in like or different units
- Identify independent and dependent variables
- Use tables, and unit rate
- Define the constant of proportionality
- Solve for missing values
- Write equations from proportional relationships from word problems
- **Vocabulary and Key Terms** – Convert, Fractions, Decimals, Equivalent, Multiply, Divide, Rates, Ratios, Unit Rate, Denominator, Numerator, Greatest common factor, Quantities, Variables, tables, constant of proportionality, Unknown Quantity, Proportional relationships, Proportion

2. Proportional Relationship in Graphs

- Evaluate unit rates in equations in the form of $y=kx$
- Evaluate in graphs of proportional relationships as the ordered pair (l,r) .
- Identify the linear relationship does go through the origin
- Write equations from proportional relationships in graphs
- Interpret proportional relationships represented in graphs
- **Vocabulary and Key Terms** – Convert, Fractions, Decimals, Equivalent, Multiply, Divide, Ratios, Unit Rate, Denominator, Numerator, Quantities, Variables, Independent, Dependent, tables, constant of proportionality, Unknown quantity, Proportional relationships, Proportion, Origin, Graph is proportional

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3. Proportional Relationship in Tables

- Represent proportional relationships in tables
- Determine the constant of proportionality in tables
- Write equations from proportional relationships presented in tables
- **Vocabulary and Key Terms** – Convert, Fractions, Decimals, Equivalent, Multiply, Divide, Ratios, Unit Rate, Denominator, Numerator, Quantities, Variables, Independent, Dependent, tables, constant of proportionality, Unknown Quantity, Proportional relationships, Proportion

4. Nonproportional Relationships

- Compare proportional and nonproportional relationships
- Identify the linear relationship does not go cross through the origin
- **Vocabulary and Key Terms** – Fractions, Decimals, Equivalent, Multiply, Divide, Ratios, Unit Rate, Denominator, Numerator, Greatest common factor, Quantities, Variables, Independent, Dependent, tables, constant of proportionality, Unknown Quantity, Proportional relationships, Proportion

6. Scale Drawing

- Define and identifying scale drawings
- Determine scale factor between two images
- Use scale factor to draw scale images
- Evaluate a scale to determine actual measurements
- Create and evaluate maps using scales to find actual distance between locations
- Evaluate floor plans using scales to find actual measurements and dimensions
- Compute actual areas from scale drawings
- Draw scale drawing at different scales using proportions.
- **Vocabulary and Key Terms** – Fractions, Decimals, Equivalent, Multiply, Divide, Ratios, Denominator, Numerator, Quantities, Variables, Unknown Quantity, Proportional relationships, Proportion, Equivalent, Scale Drawing, Scale Factor, Scale, Scaled Copy, Corresponding, Similar

Interdisciplinary Connection:

- Language Arts – Word Problems
- Science – Word Problems

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Daily Learning Objectives with *TWPS Activities*

Students will be able to...

- Describe and find equivalent ratios.
 - *TWPS – Can we recall the three ways to write a ratio? Explain using mathematical reasoning.*
- Compute the unit rate associated with ratios of fractions
 - *TWPS – Which one is the lie? Ratio Edition. Explain using mathematical reasoning.*
- Calculate the cross product to determine if the two ratios are in proportion (equivalent)
 - *TWPS – Which one is the lie? Equivalent Ratios Edition. Explain using mathematical reasoning.*
- Analyze ratios in a table/diagram to determine if the ratios are equivalent by finding constant of proportionality
 - *TWPS – How do you find equivalent ratios? Complete the examples to help you explain using mathematical reasoning.*
- Construct and analyze graphs of ratios on a coordinate plane to determine if the ratios are proportional
 - *TWPS – Given two ratios, how do you determine if they are equivalent? Complete the examples to help you explain using mathematical reasoning. Also, review how to plot points on a coordinate plane.*
- Compute, evaluate, and explain the rate of change/slope from a graph (rise over run) or equation ($y=mx$)
 - *TWPS – Determine which graph doesn't belong. Explain using mathematical reasoning.*
- Justify the meaning of a point on a graph $y=mx$ of a real-life situation
 - *TWPS – Which one is the lie? Proportional Graph Edition. Explain using mathematical reasoning.*
- Compute the actual length of a figure from a scale drawing
 - *TWPS – Which one is the lie? Proportional Table Edition. Explain using mathematical reasoning.*
- Apply a scale from one drawing to create a second scale for that drawing
 - *TWPS – Describe how to create a second figure given an original figure. Explain using mathematical reasoning.*

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Instructional Strategies/Differentiated Instruction

- TWPS
- Whole group instruction
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Homework
- Highlighted words
- Fill in the blanks
- Access to multiplication chart
- Access to calculator
- Color coded notes
- Pre-teaching/Reteaching

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments

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Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups (SBAC)
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Accountable Talk Discussions
- Do Now
- Student-led instruction
- Homework
- Performance Task – Which Pizza is the Best Value?
 - Summative Performance Task Assessment Rubric

SUMMATIVE ASSESSMENTS:

- Pear Assessment Quiz 1 – EU 1
- Unit 3 Test – EU 1 and 2
- FIAB – Ratios and Proportional Relationships
- Performance Task – Which Pizza is the Best Value?

Unit Task

Unit Task Name: Which Pizza is the Best Value?

Description: Students will use information in this unit about ratios and unit rates to compare quantities (EU 1) and determine which pizza is the best value. Students will find the price of each topping (unit price/rate) for three sizes of pizzas and identify the pizza with the least cost per topping. They will then be given a specific number of friends that will share that identified pizza and find out how much each person will have to pay. Students will also use their knowledge of setting up proportions to compare quantities (EU 1) of cheese and pepperoni used to make pizza.

Evaluation: Summative Performance Task Assessment Rubric

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Unit Resources

- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Pear Assessment
- Individual Whiteboards
- 2 Truths & One Lie
- State Common Core Standards Transition Tasks
- Online resources