

Ratios & Rates

Real-World PBL

Food Truck Empire Business Plan

5-Day Project Unit

Covers: 6.RP.A.1 | 6.RP.A.2 | 6.RP.A.3a | 6.RP.A.3b | 6.RP.A.3c | 6.RP.A.3d

Grade 6 Mathematics

UM Printables

Premium TPT Resource | Project-Based Learning

Table of Contents

SECTION A: TEACHER RESOURCES

Teacher Pacing Guide (Days 1-5)

Learning Targets & Standards Alignment

Materials & Preparation Checklist

SECTION B: STUDENT PROJECT PACKET

Day 1 - Recipe Scaling (6.RP.A.1 & 6.RP.A.3a)

Day 2 - Pricing & Unit Rate (6.RP.A.2 & 6.RP.A.3b)

Day 3 - Marketing with Percents (6.RP.A.3c)

Day 4 - Operations & Conversions (6.RP.A.3d)

Day 5 - Investor Pitch (All Standards)

SECTION C: SUPPLEMENTARY MATERIALS

Vocabulary Cards (12 terms)

Exit Tickets (5)

Anchor Charts (4)

Math Journal Prompts (5)

SECTION D: ASSESSMENT

4-Criterion Analytic Rubric

Shark Tank Investor Pitch Evaluation Form

SECTION E: ANSWER KEY & EXEMPLARS

Day 1 Answer Key with Worked Solutions

Day 2 Answer Key with Worked Solutions

Day 3 Answer Key with Worked Solutions

Day 4 Answer Key with Worked Solutions

Day 5 Answer Key with Worked Solutions

Sample Student Exemplars

SECTION F: CLOSING

Ingredient	Amount	Ratio to 6 servings
Ground beef	2 lbs	2 : 6
BBQ sauce	1.5 cups	1.5 : 6
Slider buns	12 buns	12 : 6
Cheddar cheese slices	12 slices	12 : 6
Dill pickle chips	24 chips	24 : 6
Coleslaw	1.5 cups	1.5 : 6

Lemonade Stand - Fresh-Squeezed Lemonade (serves 8)

Ingredient	Amount	Ratio to 8 servings
Fresh lemon juice	2 cups	2 : 8
Granulated sugar	1.5 cups	1.5 : 8
Water	8 cups	8 : 8
Ice	4 cups	4 : 8
Lemon slices (garnish)	8 slices	8 : 8
Mint sprigs	8 sprigs	8 : 8

Step 3: Build Your Ratio Table

Use your chosen recipe to complete the ratio table below. Show how each ingredient scales as you increase the number of servings. Write the scale factor for each column.

Servings	Ingredient 1	Ingredient 2	Ingredient 3	Scale Factor
Original				
Double				
Scale: 10				
Scale: 25				
Scale: 50				

Step 4: Ratio Reasoning Questions

1. Write the ratio of pork shoulder to servings in simplest form for the taco recipe. Explain what this ratio means in the context of the recipe.

Day 2: Pricing & Unit Rate

6.RP.A.2 - Understand unit rate | 6.RP.A.3b - Solve unit rate problems

Your Food Truck Challenge: Now that you can scale recipes, it is time to price your menu! You will calculate unit prices, compare suppliers to find the best buy, and set your menu prices using unit rate reasoning.

Step 1: Compare Suppliers - Find the Unit Price

Your food truck needs ingredients. Two suppliers offer different package sizes. Calculate the unit price (cost per pound or cost per item) for each supplier, then circle the better buy.

Ingredient	Supplier A Deal	Supplier A Unit Price	Supplier B Deal	Supplier B Unit Price	Better Buy
Pork shoulder	3 lbs for \$12.75		5 lbs for \$19.50		
Ground beef	2 lbs for \$9.40		4 lbs for \$17.60		
Cheese	1.5 lbs for \$7.20		3 lbs for \$13.80		
Lemons	12 for \$4.80		20 for \$7.00		
Sugar	4 lbs for \$3.60		10 lbs for \$8.50		
Tortillas	36 for \$5.40		50 for \$8.25		
BBQ sauce	2 jars for \$7.50		5 jars for \$16.25		

Step 2: Set Your Menu Prices

Use unit rate reasoning to set prices for your menu items. A good rule of thumb: your food cost should be about 25-30% of your menu price. Calculate the ingredient cost per serving, then determine a menu price that gives you a healthy profit margin.

Menu Item	Ingredient Cost per Serving	Menu Price	Food Cost %	Profit per Serving
Street Taco (each)				
Slider (each)				
Lemonade (cup)				
Combo: 2 Tacos + Drink				
Combo: 2 Sliders + Drink				

Step 3: Unit Rate Reasoning Questions

Day 4: Operations & Conversions

6.RP.A.3d - Use ratio reasoning to convert measurement units

Your Food Truck Challenge: Running a food truck means working with measurements in both customary and metric systems. A recipe might call for 500 mL but your measuring cup shows ounces. A supplier quotes prices per kilogram but you order in pounds. Today you will master measurement conversions using ratio reasoning!

Key Conversion Ratios

Customary to Metric	Conversion Ratio	Metric to Customary	Conversion Ratio
1 inch	2.54 cm	1 cm	0.3937 in
1 foot	30.48 cm	1 meter	3.2808 ft
1 pound	0.4536 kg	1 kilogram	2.2046 lbs
1 ounce	28.35 g	1 gram	0.0353 oz
1 fluid ounce	29.57 mL	1 liter	33.814 fl oz
1 gallon	3.785 L	1 liter	0.2642 gal
1 cup	236.59 mL	1 liter	4.227 cups

Step 1: Convert Your Recipe

Your international food truck inspector says all recipes must be in metric units. Convert your recipe ingredients from customary to metric. Show the conversion ratio you use for each.

Ingredient	Original Amount	Conversion Ratio Used	Metric Amount	Show Your Work
Pork shoulder	1.5 lbs			
Pineapple chunk	2 cups			
BBQ sauce	1.5 cups			
Lemon juice	2 cups			
Sugar	1.5 cups			
Water	8 cups			

Step 2: Weekly Supply Order

You operate 5 days a week, serving an average of 120 customers per day. Calculate your weekly supply needs, converting between units as needed.

SECTION C: Supplementary Materials

Vocabulary Cards

Directions: Cut out each card along the dotted lines. Keep them as a reference throughout the Food Truck Empire project. Quiz yourself or a partner!

Ratio

A comparison of two quantities using a colon, the word "to," or a fraction bar. Example: The ratio of tacos to customers is 3:4, meaning 3 tacos for every 4 customers.

Equivalent Ratios

Ratios that express the same relationship between quantities. You can find them by multiplying or dividing both terms by the same number. Example: 2:3 is equivalent to 4:6 and 6:9.

Anchor Charts

Directions: These anchor charts can be printed poster-size for classroom display or kept in student binders as reference sheets. Each chart summarizes a key concept from the Food Truck Empire unit.

Anchor Chart 1: Understanding Ratios

What is a Ratio?

A ratio compares two quantities. There are three ways to write a ratio:

Using a colon: 3 : 4 ("3 to 4")

Using "to": 3 to 4

Using a fraction: $\frac{3}{4}$

Food Truck Example: The ratio of pork (1.5 lbs) to servings (4) is 1.5 : 4. This means for every 4 servings, you need 1.5 pounds of pork.

Equivalent Ratios: Multiply or divide both terms by the same number.

$$1.5 : 4 = 3 : 8 = 4.5 : 12 = 7.5 : 20$$

How to Check: Two ratios a:b and c:d are equivalent if $a \times d = b \times c$.

Check: $1.5 \times 8 = 12$ and $4 \times 3 = 12$. They are equivalent!

Anchor Chart 2: Finding Unit Rate

What is a Unit Rate?

A unit rate is a rate with a denominator of 1. It tells you the amount per ONE unit.

How to Find It: Divide the numerator by the denominator.

Example: 3 lbs of pork costs \$12.75.

$$\text{Unit rate} = \$12.75 / 3 \text{ lbs} = \$4.25 \text{ per pound}$$

This means EACH pound of pork costs \$4.25.

Best Buy Strategy: Find the unit price for each option. The lower unit price is the better buy.

SECTION D: Assessment

Project Rubric

4-Criterion Analytic Rubric - Use this rubric to evaluate the complete Food Truck Empire business plan and investor pitch. Score each criterion from 1 (Beginning) to 4 (Exemplary).

Criterion	4 - Exemplary	3 - Proficient	2 - Developing	1 - Beginning
Mathematical Accuracy	All calculations are correct. Ratio tables, unit rates, percent calculations, and conversions are precise with no errors. Work shows meticulous attention to decimal placement and units.	Most calculations are correct (1-2 minor errors). Ratio tables and unit rates are generally accurate. May have small rounding or arithmetic errors that do not affect the overall reasoning.	Several calculation errors are present. Some ratio tables or unit rates are incorrect. Errors suggest gaps in procedural knowledge but some understanding of the process is evident.	Frequent calculation errors. Ratio tables, unit rates, or conversions are largely incorrect. Student does not demonstrate accurate procedural execution.
Ratio Reasoning	Demonstrates deep understanding of ratio concepts. Uses multiple strategies (tables, proportions, scale factors) fluently. Makes connections between ratios, rates, and percents. Explanations are clear and mathematically precise.	Shows solid understanding of ratio concepts. Uses at least two strategies effectively. Recognizes relationships between ratios, rates, and percents. Explanations are mostly clear with minor gaps.	Shows basic understanding but relies on one strategy. May struggle with proportional reasoning or connecting ratios to percents. Explanations are partial or lack precision.	Limited understanding of ratio concepts. Cannot consistently set up or solve ratio problems. Explanations are missing, unclear, or mathematically incorrect.
Business Justification	All mathematical decisions are justified with business reasoning. Clearly explains why a supplier, price, or promotion is chosen using data. Makes a compelling, evidence-based case for the food truck concept.	Most decisions are justified with business reasoning. Uses data to support choices but may lack depth in some areas. Business case is generally sound.	Some decisions are justified, but others lack explanation. May make claims without sufficient data. Business reasoning is present but underdeveloped.	Decisions are made without clear justification. Mathematical choices are not explained in business context. Little or no evidence of connecting math to the food truck scenario.

Criterion	4 - Exemplary	3 - Proficient	2 - Developing	1 - Beginning
Presentation Quality	Pitch is well-organized, engaging, and within time limits. Uses precise mathematical language throughout. Visuals and data are clear and professional. Confidently answers investor questions with ratio-based evidence.	Pitch is organized and mostly within time limits. Uses mathematical language with occasional imprecision. Visuals support the presentation. Can answer most questions with evidence.	Pitch shows some organization but may exceed time limits or lack clarity. Mathematical language is inconsistent. Visuals may be incomplete. Struggles to answer questions with evidence.	Pitch is disorganized or significantly over/under time. Rarely uses mathematical language. No visuals or they are unclear. Cannot answer questions about the mathematical reasoning.

Scoring Summary

Criterion	Score (1-4)	Comments
Mathematical Accuracy		
Ratio Reasoning		
Business Justification		
Presentation Quality		
TOTAL		(Max: 16 points)

Grade Scale: 14-16 = A (Exemplary) | 11-13 = B (Proficient) | 8-10 = C (Developing) | 4-7 = D (Beginning)

Shark Tank Evaluation Form

Investor Pitch Peer Evaluation

Evaluator Name: _____ Date: _____

Food Truck Name: _____ Presenter(s): _____

Rate each category from 1 (weak) to 4 (strong). Circle your rating.

Category	Criteria	1	2	3	4
Mathematical Accuracy	Were all calculations, ratios, and rates correct?				
Use of Ratio Language	Did the presenter use precise ratio and rate vocabulary?				
Business Logic	Did the pricing, promotions, and supply decisions make sense?				
Visual Presentation	Were charts, tables, and the coupon design clear and professional?				
Confidence & Clarity	Was the pitch well-rehearsed, engaging, and within time?				
Response to Questions	Could the presenter answer investor questions with evidence?				
Overall Investment Appeal	Would you invest in this food truck? Why or why not?				
TOTAL SCORE					/ 28

Investor Comments:

Strengths:

Areas for Improvement:

WHAT'S INCLUDED

FOOD TRUCK EMPIRE PBL • GRADE 6 • RATIOS & RATES

SECTION A: TEACHER RESOURCES

- Teacher Pacing Guide (5-day detailed schedule)
- Materials & Preparation Checklist
- Differentiation Guide (EL, Gifted, Special Needs)
- Parent/Guardian Letter
- CCSS Standards Crosswalk

SECTION B: STUDENT PROJECT PACKET (15 pages)

- Day 1: Recipe Scaling & Ratios + Practice
- Day 2: Pricing & Unit Rate + Practice
- Day 3: Marketing with Percents + Practice
- Day 4: Operations & Measurement Conversions + Practice
- Day 5: Investor Pitch (Shark Tank Style) + Extension

SECTION C: SUPPLEMENTARY MATERIALS

- Vocabulary Cards (12 key terms with definitions)
- 5 Exit Tickets (one per day, standards-aligned)
- Anchor Charts (3: Ratios, Unit Rate, Conversions)
- 5 Math Journal Prompts
- Quick Reference Sheets (conversion tables, strategies)

SECTION D: ASSESSMENT

- 4-Criterion Analytic Rubric (detailed descriptors)
- Shark Tank Investor Pitch Evaluation Form
- Student Self-Assessment Reflection

SECTION E: ANSWER KEY & EXEMPLARS

- Complete Answer Key with step-by-step solutions
- Practice Problem Answer Keys (all 4 days)
- Sample Student Exemplars (high-quality work samples)

82

PAGES

5

DAYS

6

STANDARDS

15

WORKBOOK PGS

6.RP.A.1 • 6.RP.A.2 • 6.RP.A.3a-d