

RESTAURANT OWNER MATH

Decimal Operations Real-World PBL

Grade 6 | All 4 Operations | 6.NS.B.3

A 5-day project-based learning unit where students become restaurant owners and use all four decimal operations to manage receipts, scale recipes, split bills, compute profit-and-loss statements, and prepare an investor pitch. Includes 3-tier differentiation (Modified / On-Level / Challenge), differentiated recipe cards, a place-value alignment chart, a 4-criterion analytic rubric, complete worked answer keys, CCSS alignment, anchor charts, and a teacher pacing guide.

- 5-Day PBL Unit: Add, Subtract, Multiply & Divide Decimals
- 14-Page Student Packet with Full Workspace
- 3-Tier Differentiated Recipe Cards with Real Decimal Costs
- Printable Place-Value Chart for Decimal Alignment
- 4-Criterion Analytic Rubric (Accuracy / Fluency / Application / Presentation)
- Complete Answer Key with Step-by-Step Worked Solutions
- CCSS Alignment Chart & Anchor Charts
- Teacher Pacing Guide with Daily Learning Targets

UM Printables

Premium Educational Resources



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Anchor Chart: Four Decimal Operation Algorithms

This anchor chart provides a visual reference for the standard algorithms of all four decimal operations. Display this chart in your classroom or provide printed copies to students as they work through each day of the Restaurant Owner Math PBL unit. The key principle across all operations is **place-value awareness** — always know where the decimal point belongs and why.

ADDITION WITH DECIMALS

Step 1: Line up the decimal points vertically. Add zeros as placeholders so each number has the same number of decimal places.

Step 2: Add column by column from right to left, just like whole-number addition.

Step 3: Carry (regroup) when a column sums to 10 or more.

Step 4: Bring the decimal point straight down into the answer.

Example: \$127.85 + \$48.75

$$\begin{array}{r} \$127.85 \\ + \$48.75 \\ \hline \$176.60 \end{array}$$

Decimal-Point Tip: The decimal point in the answer must line up with the decimal points in the problem. If the decimals are not aligned, the answer will be wrong!

SUBTRACTION WITH DECIMALS

Step 1: Line up the decimal points vertically. Add zeros as placeholders.

Step 2: Subtract column by column from right to left.

Step 3: Regroup (borrow) when the top digit is smaller than the bottom digit.

Step 4: Bring the decimal point straight down into the answer.

Example: \$430.00 - \$255.50

$$\begin{array}{r} \$430.00 \\ - \$255.50 \\ \hline \$174.50 \end{array}$$

Regrouping Tip: When you borrow across a zero, keep borrowing leftward until you reach a non-zero digit. That digit decreases by 1, and every zero you passed becomes 9.

MULTIPLICATION WITH DECIMALS

DAY 1: ADDITION & SUBTRACTION

Daily Receipts, Expenses, & Net Profit

Scenario: You are Luna, the owner of Luna's Bistro. Each day, you need to track how much money comes in (revenue) and how much goes out (expenses). Your **net profit** is the money left over after paying all expenses. Today you will use **decimal addition** to total your receipts and **decimal subtraction** to find your net profit.

Learning Target: I can fluently add and subtract multi-digit decimals to calculate restaurant receipts, expenses, and net profit.

Problem 1 [On-Level]

Luna's Bistro had the following sales on Monday: Lunch revenue \$127.85, Dinner revenue \$253.40, Beverage revenue \$48.75. What was the total revenue for Monday?

Show your work (align decimal points!):

Answer: \$_____

Problem 2 [On-Level]

On Tuesday, Luna's Bistro earned \$312.60 in total revenue. The expenses for the day were: Food supplies \$98.45, Staff wages \$124.30, Utilities \$32.75. What were the total expenses?

Show your work (align decimal points!):

Answer: \$_____

Problem 3 [On-Level]

Using your answers from Problems 1 and 2: On Monday, Luna's Bistro had revenue of \$430.00 and expenses of \$255.50. What was the net profit for Monday?

DAY 2: MULTIPLICATION

Scaling Recipe Costs by Number of Servings

Scenario: Now Luna needs to cater events! When you scale a recipe, you multiply the cost per serving by the number of servings. For example, if a dish costs \$0.85 per serving and you need 250 servings, you calculate $\$0.85 \times 250$. Today you will practice **decimal multiplication** to find total ingredient costs for catering orders.

Learning Target: I can fluently multiply multi-digit decimals to scale recipe ingredient costs by the number of servings.

Problem 1 [On-Level]

Luna's signature pasta costs \$3.75 per serving to make. She needs to prepare 48 servings for a catering event. What is the total ingredient cost?

Show your work (multiply, then count decimal places!):

Answer: \$ _____

Problem 2 [On-Level]

A side salad costs \$0.85 per serving. The restaurant prepares 250 servings for a banquet. What is the total cost?

Show your work (multiply, then count decimal places!):

Answer: \$ _____

Problem 3 [On-Level]

Flour costs \$4.25 per pound. Luna needs 12.5 pounds for the week's bread recipes. What is the total flour cost?

DAY 3: DIVISION

Splitting Bills & Cost-per-Unit Analysis

Scenario: At the end of a shift, Luna needs to divide the tips pool among her staff members. She also wants to compare the cost per ounce of buying ingredients in bulk versus retail packages. Today you will practice **decimal division** to split amounts evenly and calculate unit costs.

Learning Target: I can fluently divide multi-digit decimals to split bills evenly and calculate cost-per-unit for bulk versus retail purchasing.

Problem 1 [On-Level]

A group of 8 staff members share a tips pool of \$342.50 evenly. How much does each staff member receive?

Show your work (long division with decimals!):

Answer: \$_____

Problem 2 [On-Level]

A 10-pound bag of rice costs \$18.50. What is the cost per pound?

Show your work (long division with decimals!):

Answer: \$_____

Problem 3 [On-Level]

Bulk olive oil costs \$42.75 for a 5-liter container (\$8.55 per liter). A retail bottle costs \$9.40 for 1 liter. How much do you save per liter by buying in bulk?

Differentiated Recipe Cards

These recipe cards provide three tiers of decimal multiplication practice within the restaurant context. Each card lists real ingredient costs and asks students to scale the recipe for a different number of servings. The **Modified** card uses simpler decimals, the **On-Level** card uses standard commercial pricing, and the **Challenge** card includes premium ingredients with complex decimal costs and a multi-event scaling scenario.

Signature Pasta Carbonara — MODIFIED TIER

Original recipe serves: 20 people

Ingredient	Cost	Unit	Quantity	Unit	Subtotal
Pasta	\$2.50	per lb	5	lbs	\$12.50
Eggs	\$0.50	each	10	each	\$5.00
Cheese	\$4.00	per lb	2	lbs	\$8.00
Bacon	\$6.00	per lb	3	lbs	\$18.00
TOTAL					\$43.50

Scaling Challenge: If you need to serve 50 people instead of 20, what is the total cost of each ingredient at the new quantity?

Show your scaling calculations:

Total scaled cost: \$ _____

Grilled Salmon with Herb Butter — ON-LEVEL TIER

Original recipe serves: 24 people

Ingredient	Cost	Unit	Quantity	Unit	Subtotal
Salmon fillets	\$8.75	per lb	6	lbs	\$52.50
Herb butter	\$5.25	per lb	1.5	lbs	\$7.88
Asparagus	\$3.85	per lb	4	lbs	\$15.40
Lemon	\$0.65	each	12	each	\$7.80

4-Criterion Analytic Rubric

This rubric assesses student performance across four criteria on a 4-point scale. Each criterion is scored independently, allowing teachers to identify specific areas of strength and areas for growth. The total score range is 4-16 points. This rubric is used for the Day 5 Investor Pitch presentation but can also evaluate any day's work throughout the unit.

Criterion	4 — Exemplary	3 — Proficient	2 — Developing	1 — Beginning
Decimal Accuracy	All decimal calculations are correct with proper rounding; decimal points placed accurately in every answer	Most calculations correct (1-2 minor errors); decimal points generally placed correctly	Several calculation errors or inconsistent decimal placement; shows some understanding of alignment	Frequent calculation errors; decimal points often misplaced or missing; limited understanding of decimal placement
Operation Fluency	Applies all 4 operations correctly and efficiently; selects the appropriate operation for each step without prompting	Applies most operations correctly; may need minor prompting on operation choice; shows solid procedural fluency	Applies some operations correctly; inconsistent fluency across operations; may confuse operation steps	Significant difficulty with one or more operations; unable to independently select appropriate operations
Real-World Application	Strongly connects math to the restaurant context; explains financial reasoning clearly; interprets results in context	Connects math to context; explains most financial reasoning; interprets results with minor gaps	Partial connection to context; limited explanation of financial reasoning; results not fully interpreted	Minimal connection to real-world context; calculations done in isolation without contextual interpretation
Presentation	Presentation is clear, organized, and compelling; financial data is displayed effectively; confident delivery	Presentation is mostly clear and organized; financial data is understandable; adequate delivery	Presentation lacks organization or clarity; financial data is difficult to follow; hesitant delivery	Presentation is disorganized; financial data is unclear or missing; unable to communicate findings effectively

Scoring Guide:

14-16 points: Exemplary | 11-13 points: Proficient | 8-10 points: Developing | 4-7 points: Beginning

When scoring, consider the student's assigned tier. A Modified-tier student who achieves 4s on all criteria within their tier's complexity level should be scored as Exemplary, even though the decimal complexity is lower than the Challenge tier. The rubric measures fluency and understanding **at the student's level**, not comparison across tiers.

Using your answers from Problems 1 and 2: On Monday, Luna's Bistro had revenue of \$430.00 and expenses of \$255.50. What was the net profit for Monday?

Net Profit = Revenue - Expenses

\$430.00

- \$255.50

\$174.50

Hundredths: 0 - 0 = 0

Tenths: 0 - 5 → regroup: 10 - 5 = 5, borrow from ones

Ones: 9 - 5 = 4 (after borrowing)

Tens: 2 - 5 → regroup: 12 - 5 = 7, borrow from hundreds

Hundreds: 3 - 2 = 1 (after borrowing)

Net profit: \$430.00 - \$255.50 = \$174.50

Answer: \$174.50

Problem 4 [Modified]

A food truck sold \$85.50 worth of tacos and \$42.25 worth of drinks. What was the total sales?

\$85.50

+ \$42.25

\$127.75

Hundredths: 0 + 5 = 5

Tenths: 5 + 2 = 7

Ones: 5 + 2 = 7

Tens: 8 + 4 = 12 → write 12

Total: \$85.50 + \$42.25 = \$127.75

Answer: \$127.75

Problem 5 [Challenge]

Over three days, Luna's Bistro had revenues of \$347.92, \$298.67, and \$412.38. Expenses for those days were \$189.45, \$201.83, and \$223.16 respectively. Find the total net profit for all three days.

Total Revenue: \$347.92 + \$298.67 + \$412.38 = \$1,058.97

\$347.92

\$298.67

+ \$412.38

\$1,058.97

Total Expenses: \$189.45 + \$201.83 + \$223.16 = \$614.44

\$189.45

\$201.83

+ \$223.16

\$614.44

Net Profit: \$1,058.97 - \$614.44 = \$444.53

\$1,058.97

- \$614.44

What's Inside This Resource?

Restaurant Owner Math - Decimal Operations Real-World PBL

Grade 6 | CCSS.MATH.CONTENT.6.NS.B.3 | 37-page resource

5-DAY PBL UNIT

31 STUDENT PROBLEMS

3 DIFFERENTIATION TIERS

STUDENT PACKET - 15 PAGES

Pages 9-23 of the full resource.

- Day 1: Receipts, expenses & net profit
- Day 2: Scaling recipe costs
- Day 3: Tips & cost-per-unit analysis
- Day 4: Weekly profit & loss
- Day 5: Investor pitch & financial summary
- Structured workspace + additional practice

TEACHER + REFERENCE MATERIALS

- Teacher Pacing Guide with daily learning targets
- CCSS Alignment Chart for 6.NS.B.3
- Anchor Chart: Four Decimal Operation Algorithms
- Printable Place-Value Chart for Decimal Alignment

DIFFERENTIATED RECIPE CARDS - 2 PAGES

Three recipe cards provide decimal multiplication in a restaurant context:

- Modified - Signature Pasta Carbonara
- On-Level - Grilled Salmon with Herb Butter
- Challenge - Truffle Mushroom Risotto

Cards include ingredient costs, quantities, subtotals, and scaling tasks.

ASSESSMENT + ANSWER KEY

- 4-Criterion Analytic Rubric (1 page)
- Decimal Accuracy
- Operation Fluency
- Real-World Application
- Presentation
- 10-page complete worked answer key for student problems and recipe-card tasks

CULMINATING BUSINESS APPLICATION

Students use decimal operations in a restaurant-owner scenario that builds from daily financial work to a final investor pitch.

The full unit includes weekly profit-and-loss work, restaurant expansion projections, financial reasoning, and a presentation checklist.

The resource ends with a one-page review request/feedback page (page 37).

AT A GLANCE

37 total pages | 15-page student packet | 2-page recipe-card section | 1-page rubric | 10-page answer key