Launch a Food Truck

Use linear models to set a price, find the break-even point and plan a profitable first month.

Unit 12: Linear Models & Rates | 3 class periods | Small groups (3–4)

Name(s) _____ Period ____ Due _____

Introduction

Your team is launching Taco Town, a fictional food truck. You will model its costs and revenue, find how many plates it must sell to break even, choose a price using a demand table, and pick a payment-processing plan.

> Fixed costs: $2,400 a month (permit, parking, insurance and the truck payment). Each plate costs $3.60 in ingredients and packaging. A market survey estimated monthly demand at four prices (table). Card payments go through one of two processors.

Learning goals

- Write linear cost, revenue and profit models.
- Find and interpret break-even points.
- Use a demand table to compare prices.
- Compare two fee plans with a system of equations.
- Recommend a launch plan.

Supporting documents and data

Estimated monthly demand (fictional survey)

Price per plate	Plates sold per month
$8	620
$9	540
$10	460
$11	380

Card processors

Processor	Monthly fee	Fee per sale
SwipeEasy	$0	$0.30 + 2.9% of the sale

Processor	Monthly fee	Fee per sale
FlatPay	$49	$0.10 + 2.5% of the sale

Tasks

Task 1: Models

1. Write the total cost C(q), revenue R(q) and profit P(q) for a $9 price.
2. Explain what the slope and intercept of C(q) mean.

Deliverable: Three models with meanings.

Task 2: Break-even

1. Find the break-even number of plates at each price.
2. Graph C(q) and R(q) for $9 and mark the break-even point.

Deliverable: Break-even table and graph.

Task 3: Choose a price

1. Use the demand table to find monthly profit at each price.
2. Which price gives the most profit? Is that the price you would choose?

Deliverable: Profit table and price choice.

Task 4: Card processor

1. With an average sale of $10, write each processor’s monthly cost for s card sales.
2. Find the number of sales where they cost the same.

Deliverable: Processor choice.

Task 5: Pitch

1. Present your launch plan to “investors”: price, break-even, expected profit, and one risk.

Deliverable: 4–5 slides.

Reflection

1. Why does a higher price lower the break-even point but not always raise profit?

2. What could make the demand estimates wrong?

3. Which costs could the truck cut first?

Submission checklist

- ☐ Cost, revenue and profit models
- ☐ Break-even table and graph
- ☐ Profit table and price

- [ ] Processor comparison
- [ ] Pitch
- [ ] Reflection

Scoring rubric

Category (points)	Exemplary (100%)	Proficient (~80%)	Developing (~60%)	Beginning (~30%)
Financial understanding (20)	Uses vocabulary precisely and explains every financial concept involved, including assumptions.	Mostly accurate explanations with minor vocabulary gaps.	Partial understanding; some concepts misapplied.	Little evidence of understanding.
Mathematical accuracy (25)	Models, break-even quantities and profits correct; rounding up for whole plates.	1–2 minor errors that do not change conclusions.	Several errors or missing work.	Calculations largely missing or incorrect.
Analysis & comparison (20)	Compares every option on the same basis and tests at least one changed assumption.	Compares options with small gaps.	Comparison superficial or uneven.	Little analysis.
Justification (15)	Recommendation is supported by specific numbers and weighs non-financial factors and risks.	Mostly supported.	Mostly opinion.	No justification.
Communication & presentation (10)	Clear, organized, well-labeled tables, charts, and writing.	Minor clarity issues.	Hard to follow in places.	Disorganized.
Completion (10)	Every checklist item complete.	One item missing.	Two or three items missing.	Most items missing.

Total: 100 points. Alternative recommendations earn full credit when supported by accurate evidence.

ALL PEOPLE, BUSINESSES, PLACES, AND NUMBERS IN THIS PROJECT ARE FICTIONAL. RATES AND COSTS ARE ILLUSTRATIVE ASSUMPTIONS.