Designer Pizza

Task Statement

Student Material



How do you like your pizza?

Pizza Hut returned its "Big New Yorker" pizza in time for the 2023 Super Bowl. A *Dallas Morning News* article wrote: "this XL pizza comes with six oversized foldable slices and can be customized beyond the traditional double pepperoni order."

Nowadays, many pizza shops offer a variety of pizzas by the slice. For example, you could buy a slice of pepperoni pizza and a slice of Hawaiian pizza. Great!

Typically, pizza pies are cut into eight slices. But what if you wanted a larger slice of one kind and smaller slices of another? Say, a large piece of sausage and smaller slices of cheese and buffalo chicken? Should pizza shops let you customize pizza slices?



Can we encourage pizza shops or chains to innovate pizza purchases? What if we could show pizza owners this idea has value? What if they could offer topping options and slices of different sizes? We could use market research to show it works!

As a team, you could design sample "meal options." They would incorporate customized slice combinations. For instance, a one-eighth slice buffalo chicken, a one-fifth slice pepperoni, and two one-twelfth slices of cheese.



You will research pizza shops and determine full-size pie prices. Then you can calculate menu costs to validate your ideas. This "designer pizza" approach could become a win-win for customers and pizza shop owners!

Merriam-Webster defines *designer* as "intended to reflect the latest in sophisticated taste."

With menu in tow, take your designer pizza ideas to town and be a slice above the rest.

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Designer Pizza *Analytic Rubric*

Student Material

	Novice	*Apprentice*	*Practitioner*	*Expert*
Market Research: Survey	• survey offers at least six different types of pizzas • survey designed to gather top three choices per respondent	• survey offers at least nine different types of pizzas • survey designed to gather top three choices per respondent • survey conducted to gather data from at least ten people	• survey offers at least twelve different types of pizzas • survey designed to gather top three choices per respondent • survey conducted to gather data from at least twenty people	all of *Practitioner* plus: includes one additional survey question whose data can be graphed
Market Research: Bar Graph of Survey Results	includes survey results with data labels	includes survey results with: • data labels • key of different colors for different pizza types • an analysis statement of the most and least popular pizza types	includes survey results with: • data labels • key of different colors for different pizza types • number of votes per slice • data ordered from most to least popular • at least five analysis statements from the data	all of *Practitioner* plus: includes percentages for each type of pizza
Pizza Slice Options	• based on data, offers three or more types of pizzas, each with a specified slice size • offers three different slice sizes: fifths, quarters, and thirds	• based on data, offers five or more types of pizzas, each with a specified slice size • offers at least four different slice sizes, including: fifths, quarters, and thirds	• based on data, offers eight or more types of pizzas, each with a specified slice size • offers at least six different slice sizes: fifths, quarters, and thirds • lists slice offerings from smallest to largest	all of *Practitioner* plus: includes at least two different size options per pizza type

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Menu Offerings	• offers at least three meal options with two or more slices each • includes total size of each menu offering • includes "Pizza Designer's Log" with accurate calculations of meal size, showing all work	• offers at least eight meal options, at least four of which offer three or more slice combinations • includes total size of each menu offering, properly reduced to lowest terms • includes "Pizza Designer's Log" with accurate calculations of meal size, showing all work	• offers at least twelve meal options, at least eight of which offer three or more slice combinations • includes total size of each menu offering, properly reduced to lowest terms • includes "Pizza Designer's Log" with accurate calculations of meal size, showing all work	all of *Practitioner* plus either: • some menu items that offer five or more slice combinations that total exactly one pie or: • caloric intake for at least three of the meals
Test Marketing	• tests the plan by accurately calculating the cost of orders from three classmates who select three slices to make up a custom meal • includes all work in "Pizza Designer's Log"	• tests the plan by accurately calculating the cost of orders from six classmates who select from three to four slices to make up a custom meal • includes all work in "Pizza Designer's Log"	• tests the plan by accurately calculating the cost of orders from ten classmates who select from three to five slices to make up a custom meal • includes all work in "Pizza Designer's Log"	all of *Practitioner* plus: includes cost savings for at least three classmates had they had to purchase each desired slice as an eighth of a pie

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Teacher Material

Designer Pizza *Scaffold for Learning*



Benchmark Video and Discussions
- Unit launch to create a felt need
- Why market research?
- What bar graphs tell us
- Fractions: Parts of a whole

Instructional Activities: Learning

Instructional Texts/Websites
- Add fractions (I, P)
- Subtract fractions (I, P)
- Order fractions (I, P)
- Reduce fractions to lowest terms (I, P)
- Create survey/bar graphs (I)
- Multiply/divide with money (I)
- Spreadsheet as cost calculator (I, P)
- Calculate cost/percentages (I, P)
- Analyze data (I, P, SG)
- Create a menu (I, P, SG)

Instructional Videos
- Add fractions (I, P)
- Subtract fractions (I, P)
- Order fractions (I, P)
- Reduce fractions to lowest terms (I, P)
- Create survey/bar graphs (I)
- Multiply/divide with money (I)
- Spreadsheet as cost calculator (I, P)
- Calculate cost/percentages (I, P)
- Analyze data (I, P, SG)
- Create a menu (I, P, SG)

How-to Sheets
- Design a survey
- Conduct a survey
- Tally survey results
- Create a bar graph
- Find the LCD
- Reduce fractions to lowest terms
- Create a menu
- Create a spreadsheet

Interactive Websites
- Shodor: Fraction Sorter (I)
- Math Is Fun: Interactive Fractions (I, P)
- Visual Fractions: Fraction Designer (I)
- IXL (I)
- Khan Academy (I, HW)
- Freerice (I, HW)

Learning Centers
- Order fractions (I, P)
- Add fractions (I, P)
- Reduce fractions to lowest terms (I, P)
- Explore pizza menu items (I, P)
- Mult/divide with money (I, P)
- Analyze data (I, P, IV)

Small-Group Mini-Lessons
- Add fractions
- Subtract fractions
- Order fractions
- Reduce fractions to lowest terms
- Create survey/bar graphs
- Multiply/divide with money
- Spreadsheet as cost calculator
- Calculate cost/percentages
- Analyze data
- Create a menu

Instructional Activities: Additional

Practice
- **Create/conduct a survey (I, HW)**
- **Research pizza preferences (I, HW)**
- **Add/subtract/simplify fractions (IV)**
- **Research pizza menus (I, P)**
- **Generate bar graphs of household items (I, HW)**

Application
- **With survey results, create bar graph (I)**
- **Calculate cost/percentages (I, P)**
- **Create a pizza menu (I, P, SG)**
- **Review group members' surveys (SG)**
- **Analyze group data (I, P, SG)**
- **Check group members' calculations (SG)**

Assessment
- **Self-assess add/sub fractions (I)**
- **Self-assess create a bar graph (I)**
- **Self-assess reduce fractions (I)**
- **Use rubric to peer assess task (P)**
- **Use rubric to self-assess task (I)**

Reflection (I)
In your Designer's Log, reflect:
- **What surprised you about creating a menu?**
- **How do you feel about designer pizzas?**
- **How might this customization apply to other areas of life?**
- **What was challenging about this task?**

Key: Individual **(I)**, Pairs **(P)**, Small Groups **(SG)**, Activities suitable for homework **(HW)**, Insights Video **(IV)**

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Designer Pizza *Facilitation Grid (Week 1 Sample)*

Teacher Material

	Math												Social Studies	
M – mastered PE – peer expert R – needs reinforcement HW – needs homework ML – needs small-group mini-lesson **Student Name**	Identifies fractional parts of ½, ⅓, and ¼	Compares fractions using <, >, or =	Identifies numerator and denominator	Adds fractions with like denominators	Subtracts fractions with like denominators	Identifies the least common denominator between two or more fractions	Adds fractions with unlike denominators	Subtracts fractions with unlike denominators	Orders fractions from least to greatest	Subtracts fractions from a whole number	Reduces a fraction to lowest terms	Reduces an improper fraction to a mixed number	Names the distinctive characteristics of American society	Shows how market prices are determined

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Designer Pizza *Facilitation Questions*

Teacher Material

COMPREHENSION *Ask questions that ensure students understand content and skills needed to solve the problem.*	• What is the least common denominator? • What must be true to add or subtract fractions? • What does it mean to simplify a fraction? • How are markets interrelated?
APPLICATION *Ask questions that ensure the ability of students to apply learning to new situations.*	• How do you find the least common denominator between two fractions? Three? • How does _____ fraction relate to the whole? • Why is a bar graph the best way to represent this data? • Is there another graphical representation you could have used instead of a bar graph? • What changes in the price of one good or service can lead to changes in prices of many other goods and services around the world?
CONNECTION *Ask questions that ensure the ability of students to apply learning to their lives.*	• How does adding and subtracting fractions relate to something outside of school? • Outside of designing a pizza, where else would you order fractions? • Why is surveying people prior to designing the menu important? • How are market prices determined? • How can the buying and selling decisions made by buyers and sellers impact a price?
SYNTHESIS *Ask questions that encourage students to create new information from existing data.*	• How would the fraction change if you doubled the order? Tripled it? • How could people split the cost among them? • If you would have doubled the number of people surveyed, would the data be relatively the same? Why or why not? • What can be used to compare the market value of different goods and services? Explain your thoughts.
METACOGNITION *Ask questions that prompt students to think about their own thinking process.*	• What was the most difficult part of this task for you? • Is there another way that you could have solved that question? • Explain your thought process at arriving to that solution.

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Designer Pizza *Performance Task*

Student Material

What if you decided to use fresh garden vegetables for the pizzas you designed? You will design a garden plot based on the survey you conducted so that the farmers can maximize the right amount of vegetables per plot based on demand. Your garden plot should include tomatoes, mushrooms, olives, peppers, artichokes, onions, and spinach.

As you design, be sure to do the following:

- Include thirds, quarters, and fifths within your design (you may include other fractions, but these three are required).
- Sketch your vegetable garden design on graph paper.
- Label the vegetables and the fraction of the garden each represents.
- Include calculations to show that it totals the whole of the garden.
- Prioritize the vegetables (and fractions) from least to greatest.

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Designer Pizza *Teacher Notes*

Teacher Material

Unit Overview

What if you wanted a larger piece of everything pizza and smaller pieces of cheese pizza and buffalo chicken pizza? Maybe pizza shops should consider more customization of pizza purchases! In this ALU, students develop a high-quality menu plan and present it to a local pizza shop to innovate pizza purchases.

Common Core State Standards Addressed

CCSS.MATH.CONTENT.5.NF.A.1
CCSS.MATH.CONTENT.5.NF.A.2
CCSS.MATH.CONTENT.5.NF.B.3
CCSS.MATH.CONTENT.5.NF.B.4
CCSS.MATH.CONTENT.5.NF.B.4A
CCSS.MATH.CONTENT.5.NF.B.5A
CCSS.MATH.CONTENT.5.NF.B.5B
CCSS.MATH.CONTENT.5.NF.B.6
CCSS.MATH.CONTENT.5.NF.B.7
CCSS.MATH.CONTENT.5.NF.B.7A
CCSS.MATH.CONTENT.5.NF.B.7B
CCSS.MATH.CONTENT.5.NF.B.7C
CCSS.MATH.CONTENT.5.MD.A1
CCSS.MATH.CONTENT.6.NS.A.1
CCSS.MATH.CONTENT.6.G.A.
CCSS.MATH.CONTENT.6.G.A.2

National Standards/Content Addressed

National Social Studies Standards
NSS-EC.5-8.2; NSS-EC.5-8.7; NSS-EC.5-8.8; NSS-EC.5-8.11

Enduring Understandings	Essential Questions
• The way that data is collected, organized, and displayed influences interpretation. • There can be different strategies to solve a problem, but some are more effective and efficient than others are. • Operations create relationships between numbers. • Buying and selling decisions are made by buyers and sellers. • The relationship between price and quantity can be influenced by other factors.	• How does finding the common characteristics among similar problems help me be a more efficient problem-solver? • How do mathematical operations relate to one another? • How does comparing quantities describe the relationship between them? • How do relative prices of goods compare to others? • How is money used to compare the market value of different goods and services?

21st Century Skills Addressed

Core Content and Interdisciplinary Themes
- Subject-Area Mastery
- Financial literacy

Learning and Innovation
- Critical Thinking and Problem Solving
- Creativity and Innovation

Information and Media Literacy
- Information Literacy
- Media Literacy

Life and Career
- Productivity and Accountability
- Flexibility and Adaptability

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