

PIZZA FRACTIONS

Project Based Learning

5th Grade Print & Google Slides

PIZZA, PIZZA

SELF REFLECTION: Write a reflection on the problems and activities? Explain what you learned. Did you enjoy this activity? Why or why not?

PIZZA FRACTIONS-5

Mr. and Mrs. Caesar run a special every Sunday afternoon. If you buy 4 large pizzas, you can help you celebrate. Your parents say you can have 2 large pizzas. Read and answer the questions.

1. Large pizzas are cut into 8 equal slices. How many slices will each of you get? How many slices is your answer?

2. Your dad takes 2 slices before you. How many slices will you and your friends have?

PIZZA DATA-1

Your grade took a poll on their favorite pizza topping. Now, you and your classmates must create a bar graph using the data collected. Shade the bar graph based on the data below. Then, answer the questions.

Pepperoni IIII Olives II Meatballs IIII IIII Onions IIII
 Bacon IIII I Tomatoes IIII Mushrooms IIII

TOPPINGS	2	4	6	8	10	12	14	16
Pepperoni	[Shaded bar from 0 to 8]							
Meatballs	[Shaded bar from 0 to 16]							
Bacon	[Shaded bar from 0 to 11]							
Onions	[Shaded bar from 0 to 6]							
Olives	[Shaded bar from 0 to 5]							
Tomatoes	[Shaded bar from 0 to 9]							
Mushrooms	[Shaded bar from 0 to 8]							

1. Based on the data, how many students are in your grade? **64 students**

2. There are four classes in your grade. All classes have the same number of students. How many students are in each class?
 $64 \div 4 = 16$ students in each class

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PIZZA DATA-2

Use the data from the bar graph to create a line plot. Fill in the missing pizza names across the bottom of the line plot. Then, place Xs above the names to show the number of people who like each type of pizza best. Finally, add a title in the box.

Pepperoni |||| ||| Olives |||| || Meatballs |||| |||| |||| Onions |||| |
 Bacon |||| |||| | Tomatoes |||| |||| Mushrooms |||| ||||

PIZZA FRACTIONS-2

Today, Mrs. Caesar made 3 medium pizzas each of ten different types that she sold as single slices during lunch. She needs your help to create a plan for tomorrow using data from today.

- How many pizzas did Mrs. Caesar make?
- What is the total number of slices she had to sell today?

30 pizzas

- Read the data in the table below. It shows the fractional number of the **total slices** of each pizza after lunch. Determine the number of slices the fraction represents and write the numbers in the table.

	Bacon & Garlic	Spinach	Onion & Pepper	Veggie	Cheese	Pepperoni	Meatball	Bla
Fractional amount of the total number of pizzas left after lunch	$\frac{1}{4}$	$\frac{1}{12}$	$\frac{1}{6}$	$\frac{5}{8}$	$\frac{1}{24}$	$\frac{1}{3}$	$\frac{1}{8}$	
Number of slices left after lunch	6	2	4	15	1	8	3	16

- Ahmed says there is one set of two equivalent fractions in the table. What are the two fractions? Write or more fraction that is equivalent to these fractions. Draw a model to prove you are correct.

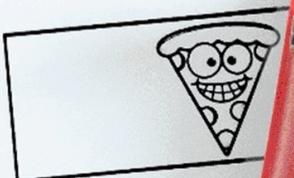
Equivalent
 $\frac{1}{4} + \frac{3}{12}$

- Mrs. Caesar wants to cut back on the number of pizzas she makes for tomorrow. She asks you to recommend **no more** than 6 pizzas to make for tomorrow's lunch. What would you tell her? Explain why.

I think you should make Cheese, Spinach, Meatball, Onion + Pepper, Bacon + Garlic and Chicken Pesto. They were the best selling pizzas.



SELF REFLECTION RUBRIC
would rate yourself on this math project.



I felt very
about the math

I understood
and did not
complet

I used
to
pr



$\frac{1}{5}$

COOKING PIZZA-3

The pizza ovens take 42 minutes to warm up before you can cook your first pizza of the day. Answer the questions below based on this information.



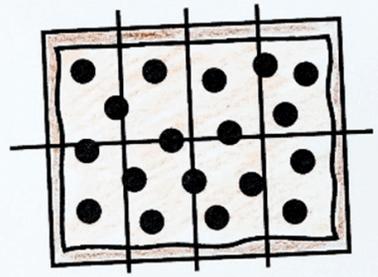
6. You and Ahmed open the restaurant on Saturday morning at 10:30 a.m. and forget to start the ovens. When Mr. Caesar arrives at 10:55 a.m., he sees that the ovens are cold. If he turns the ovens on at 10:55 a.m., when is the earliest time he can put a pizza in the oven? Solve using the number line below.

$10:55 + 42$

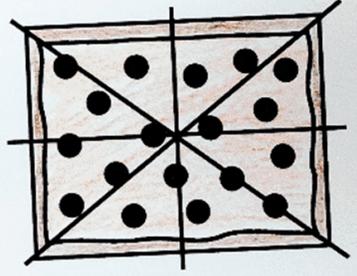
MAKE THE CUT-1

Your friends, Mara and Whit, come into the pizza shop and order individual pizzas. They ask for their pizzas to be cut into eights. This is how you cut their pizzas.

Mara's Pizza



Whit's Pizza



1. Mara asks you why her slices are smaller. Answer Mara's question.

Mara, both pizzas are the same size because they are both cut into 8ths.

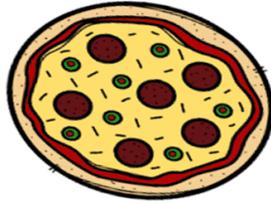
2. Mara eats five slices of her pizza. What fractional part of her pizza is left?

$\frac{1}{8}$

PIZZA FRACTIONS-1

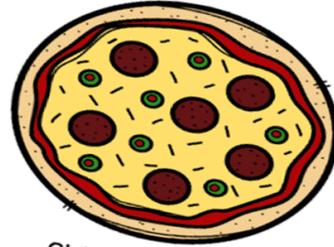
You are working at PIZZA, PIZZA, the best pizza shop in town. Today, you were asked to show Ahmed how to cut the pizzas based on the criteria from Mr. and Mrs. Caesar.

SMALL



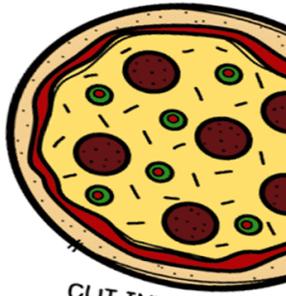
CUT INTO SIXTHS

MEDIUM



CUT INTO EIGHTHS

LARGE



CUT INTO TENTHS

1. During your lunch break, you and Ahmed ordered one large meatball pizza. Ahmed ate $\frac{3}{5}$ of the pizza, and you ate the remaining slices. How many many slices did you eat? Use the shape tool  to show with a model.
2. You and Ahmed had to cut large pizzas into 10ths for a to-go order. If you cut 120 slices, how many large pizzas are in the order? Use the shape tool  to show with a model.

$\frac{6}{1}$

$\frac{1}{5}$

$\frac{1}{8}$

$\frac{1}{4}$

TABLE OF CONTENTS

1. For the Teacher, Standards and Directions
2. For the Student, Welcome to Pizza, Pizza, Tasks
3. Pizza Fractions (Creating, ordering, equivalent fractions, and solving word problems)
4. Cooking Pizza (Elapsed time word problems)
5. Selling Pizza (Money word problems)
6. Be a Pizza Maker (Follow directions to make your own pizza with follow-up questions)
7. Make the Cut (More pizza fraction word problems)
8. Pizza Data (Make a bar graph, line plot, interpret data, write your own comparison questions)
9. Challenge 1 (Determine pizza costs and profit)
10. Challenge 2 (Complete a table using pizza data, word problems using data)
11. Challenge 3 (Create a poster for advertising spring specials)
12. Self-evaluation Reflection and Rubric
13. Answer Key



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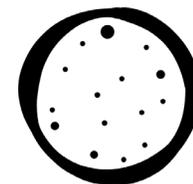
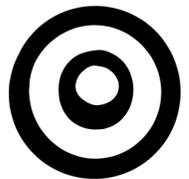
FOR THE TEACHER

PIZZA FRACTIONS is a project-based learning activity that involves using operations, base-ten, fractions, and measurement standards to solve problems related to preparing and sharing pizza.

- 5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $1/10$ of what it represents in the place to its left.
- 5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.
- 5.NBT.B.6 Find whole number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between mult./div. Illustrate and explain calculations.
- 5.NBT.B.7 Add, sub., mult., and div. decimals to the hundredths, using concrete models, drawings, or strategies based on place value, properties of operations, and/or the relationship between add./sub. Relate to a written method and explain reasoning.
- 5.NF.A.1 Add/sub. fractions with unlike denominators by replacing given fractions with equivalent fractions, in such a way as to produce an equivalent sum or difference of fractions with like denominators.
- 5.NF.A.2 Solve word problems involving add/sub of fractions referring to the same whole, including cases of unlike denominators.
- 5.NF.B.3 Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.
- 5.NF.B.4 Apply and extend previous understanding of multiplication to multiply a fraction or whole number by a fraction.
- 5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers.
- 5.MD.B.2 Make a line plot to display a data set of measurements in fractions. Use operations to solve problems in the line plots.

DIRECTIONS:

1. Decide if your class will complete the project as a whole group, in small groups, or independently.
2. Students should complete the project over several days.
3. Preview the activity with your students.
4. Students will solve operation (+, -, x, \div), place value, fraction, and measurement problems.
5. Challenge activities can be assigned or can be optional.
6. Students will complete the self-evaluation reflection and evaluation rubric.
7. Allow students an opportunity to share their completed projects.



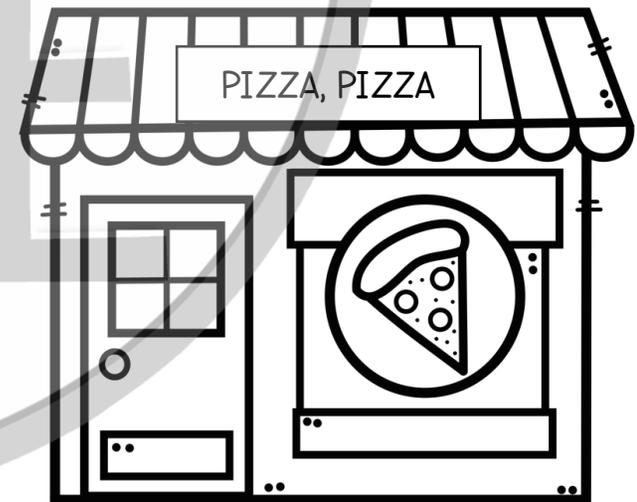
FOR THE STUDENT

Welcome to your tasty pizza adventure. You work at PIZZA, PIZZA, a popular pizza restaurant in town. Mr. and Mrs. Caesar own the shop and are teaching you all about the pizza business. Did you know that the modern pizza was born in Naples, Italy in the 18th century? In the beginning, it was considered food for the poor because it was simply a flat piece of bread covered in tomato sauce. Over time, toppings like meat, vegetables, and cheese were added to offer variety and to enhance the taste. Today, pizza as we know it is one of the most popular foods served around the world.

In this packet you will find lots of math activities that require you to use your best thinking. You will have the opportunity to be creative while having lots of fun working in a pizza shop. Read through the list of tasks below and then get started on your pizza adventure.

HERE ARE YOUR TASKS:

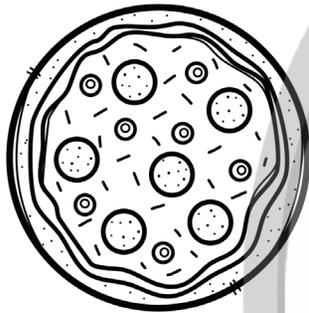
- Read each page carefully.
- Follow the directions for each page.
- Use strategies that will help explain your thinking.
- Take your time and do your best work.
- Give the challenge pages a try.
- Complete the self-reflection and evaluation rubric.
- Have fun!



PIZZA FRACTIONS-1

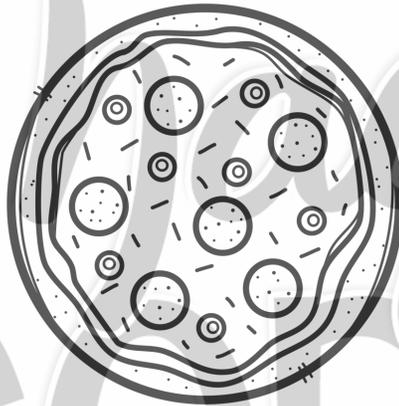
You are working at PIZZA, PIZZA, the best pizza shop in town. Today, you were asked to help Ahmed, a new employee, cut the pizzas before they are served. Draw lines to show Ahmed how to cut the pizzas based on the criteria from Mr. and Mrs. Caesar.

SMALL



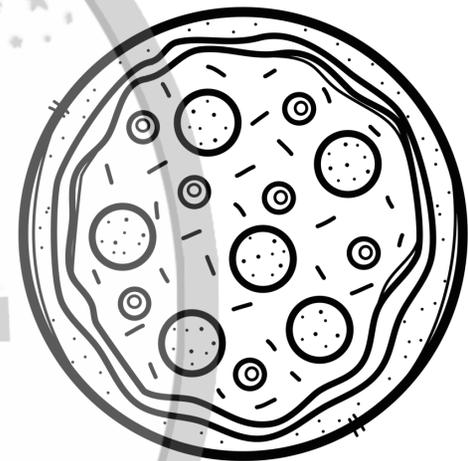
CUT INTO SIXTHS

MEDIUM



CUT INTO EIGHTHS

LARGE



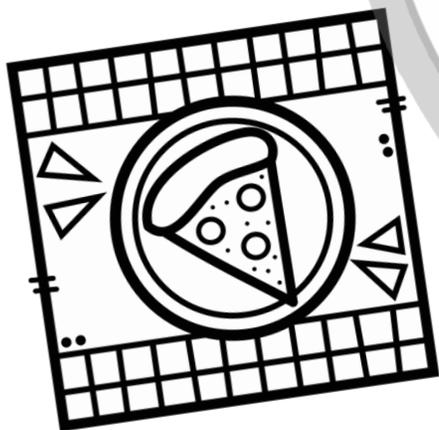
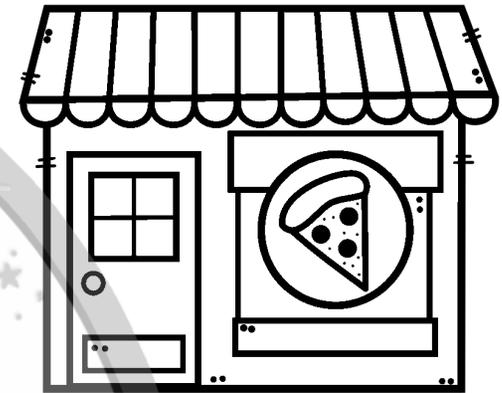
CUT INTO TENTHS

1. During your lunch break, you and Ahmed ordered one large meatball pizza. Ahmed ate $\frac{3}{5}$ of the pizza, and you ate the remaining slices. How many many slices did you eat? Show with a model.
2. You and Ahmed had to cut large pizzas into 10ths for a to-go order. If you cut 120 slices, how many large pizzas are in the order? Show with a model.

PIZZA FRACTIONS-3

On Saturday, the Barone family came into Pizza, Pizza to celebrate their mom's birthday.

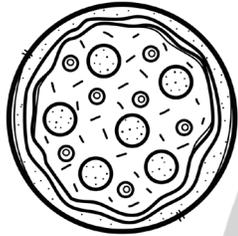
1. The family wants three large pizzas but cannot agree on toppings. Help them decide what to put on each pizza, based on their preferences. Read the information on the pages and develop a plan for the Barone family. Next, draw the toppings onto the pizzas. Then, write each person's name next to their slices to identify the ones they will eat.



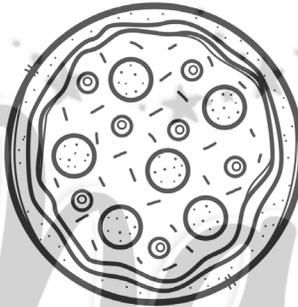
Everyone will eat 4 slices of pizza. Toppings can only be added to half or whole pizzas. All pizzas come with sauce and cheese. There will be slices left over.

COOKING PIZZA-1

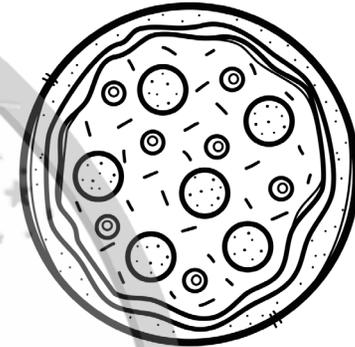
On Saturday afternoon, Mrs. Caesar asks you to keep track of the cooking times for all pizza orders. They have two ovens that can hold up to five pizzas each. Use the cooking times below to answer the questions.



SMALL PIZZAS--21 MINUTES



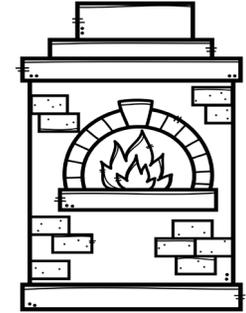
MEDIUM PIZZAS--28 MINUTES



LARGE PIZZAS--35 MINUTES

1. A group of 4 students from your school come in for lunch and order two small pizzas and one large pizza. You know that the pizzas must come out of the oven at the same time so they will be hot when they are served. How long will the large pizza be in the oven when you put the small pizza in to cook? Explain how you know.
2. Mr. Caesar is preparing a large "to-go" order and asks you to keep track of the cooking times. He made 2 large pepperoni pizzas, 4 medium meatball pizzas, 3 medium cheese pizzas, and 1 small mushroom pizza for the order. Explain how Mr. Caesar should put the pizzas into the ovens so they all come out at the same time.

COOKING PIZZA-3



The pizza ovens take 42 minutes to warm up before you can cook your first pizza of the day. Answer the questions below based on this information.

6. You and Ahmed open the restaurant on Saturday morning at 10:30 a.m. and forget to start the ovens. When Mr. Caesar arrives at 10:55 a.m., he sees that the ovens are cold. If he turns the ovens on at 10:55 a.m., when is the earliest time he can put a pizza in the oven? Solve using the number line below.

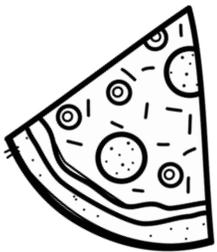


7. Your work shift ends at 4:45 p.m. on Saturday afternoon. You want to bring home 1 small olive, 1 medium cheese, and 1 large meatball pizza to share with your family for dinner. Name the times you would need to put the pizzas in the oven so that they will all be ready at 4:45 p.m.

The small olive pizza will go into the oven at _____.

The medium cheese pizza will go into the oven at _____.

The large meatball pizza will go into the oven at _____.



SELLING PIZZA-2

On Saturdays, PIZZA, PIZZA offers 2 different pizza specials. They also offer a salad deal. Use the information below to answer the questions.

- SPECIAL #1--BUY 4 LARGE PIZZAS AND GET THE LEAST EXPENSIVE ONE FOR $\frac{1}{2}$ PRICE
- SPECIAL #2--BUY 4 LARGE PIZZAS, GET 1 SMALL PIZZA FREE
- ADD 1 LARGE GREEN SALAD FREE WITH EVERY \$30.00 SPENT ON PIZZA

1. Coach Reynolds took his soccer team out for pizza after their Saturday tournament. He asked you to price each of the orders he is considering. Help Coach Reynolds pick the special that will cost him the least amount of money. Show your work and explain your reasoning. Include the difference between the two specials.

Special #1

Large Chicken Pesto	\$18.61
Large Pepperoni	\$15.45
Large Meatball	\$17.76
Large Cheese	\$14.92

Special #2

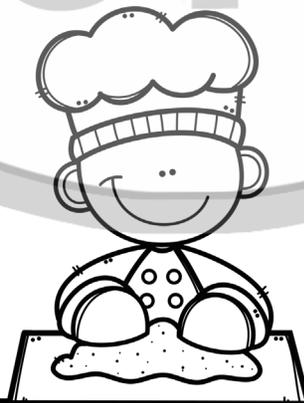
Large Chicken Pesto	\$18.61
2 Large Pepperoni	\$15.45 each
Large Meatball	\$17.76
Small Cheese Pizza	Free

2. How many salads can Coach Reynolds add for free with each special? Explain how you know.

BE A PIZZA MAKER!

You will be creating the perfect pizza to share with your best friend.
Follow the directions below to help you make the best pizza ever!

- Look at the toppings on the next page. You must put some of each topping on your pizza.
- You must have toppings on every slice of your pizza. You can have more than one topping on slices.
- Color your pizza yellow. Color the toppings you will use on your pizza.
- Cut the toppings apart and arrange them on your pizza. You must add toppings to every slice.
- You can add toppings to halves, fifths, or tenths of your pizza.. For example: you could have pepperoni on $\frac{1}{2}$ your pizza, mushrooms on $\frac{1}{5}$ your pizza, and olives on $\frac{1}{10}$ of your pizza.
- Once you have the toppings arranged the way you want them, glue them on your pizza.
- When your pizza is finished, complete the table to show the fractions for each topping and answer the questions.



BE A PIZZA MAKER!

Complete the table and answer the questions below.

TOPPING KEY	Is on _____ out of 10 slices	Write as a fraction
Green Pepper		
Pepperoni		
Black Olive		
Mushroom		

1. How many slices have pepperoni?

2. How many slices have 2 toppings?

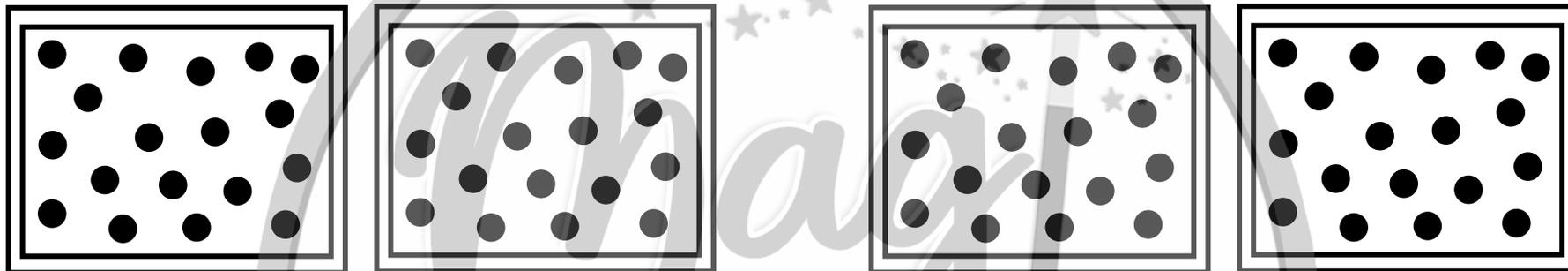
3. Write the fraction that shows the number of slices with 2 toppings.

4. How many of your slices have 3 toppings?

5. Write the fraction that shows the number of slices with 3 toppings.

MAKE THE CUT-2

Sami, Miko, and Kristen come into PIZZA, PIZZA with their Mom, Dad, Grandma, and Grandpa to celebrate the end of the school year. They order 4 large pizzas and sodas. Dad asks for two pizzas to be cut into eighths for the adults and two pizzas to be cut into ninths for the children. You must decide how to cut each pizza. Draw lines to show how you will cut the pizzas.



1. How many slices will there be for the adults?
2. How many slices will there be for the children?
3. Why do you think Dad asked for the pizzas to be cut differently?
4. How many slices can each adult eat if they share them equally? Show with an equation.
5. Kristen thinks if the children each eat $\frac{1}{3}$ of the slices, they will get 6 slices each. Is she correct? Explain.

CHALLENGE 1

Mrs. Caesar asks for your help to price the weekly specials. She wants to make a profit, while offering fair prices. It costs \$5.75 to make a large pizza with mozzarella before adding additional toppings. Use the menu and topping price chart to help her determine the difference between the cost to make each pizza and the selling price. This will be her profit.

TOPPING PRICE CHART		TODAY'S SPECIALS	
Bacon * \$1.60	Garlic * 75 cents	Nana's Favorite * Mozzarella, Chicken, Bacon, and Garlic * \$15.50	
Pepperoni * \$2.90	Peppers * 84 cents	Meat Lover's * Mozzarella, Meatball, Bacon, and Pepperoni * \$17.79	
Chicken * \$3.45	Olives * \$1.10	Lulu's Veggie * Mozzarella, Garlic, Pepper, Olive, and Mushroom * \$14.25	
Meatballs * \$3.85	Mushrooms * \$2.25	The Bomb * Mozzarella, Meatball, Bacon, Pepperoni, Pepper, and Olive * \$19.99	

1. Determine the cost to make each pizza.

Nana's Favorite

Meat Lover's

Lulu's Veggie

The Bomb

2. In June, the restaurant made a total profit of \$16,298.50, which is ten times as much as they made last June.

What was the profit PIZZA, PIZZA made last June? Explain how you moved the decimal point and why.

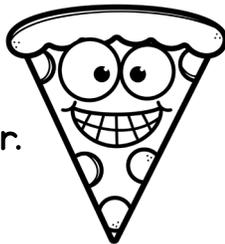
PIZZA, PIZZA

SELF REFLECTION: Write a reflection of your experience with this project. How did you feel about the math problems and activities? Explain what you found easy to do and any difficulties you had while working on this project. Did you enjoy this activity? Why or why not?

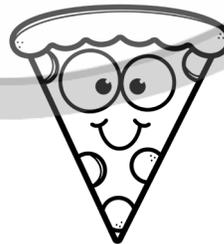
RATE THIS PROJECT

Color the pizza of the statement you most agree with.

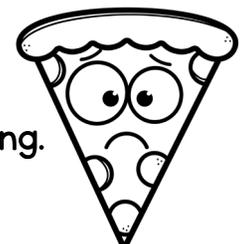
I am ready for something harder.



It was just right.

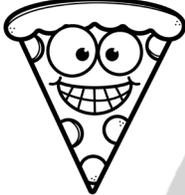
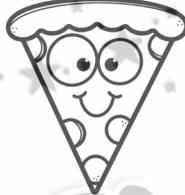
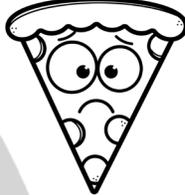


I found this very challenging.



PIZZA, PIZZA

SELF REFLECTION RUBRIC: Shade one box of the rubric for each row that expresses how you would rate yourself on this math project.

		
I felt very confident about the math in this project.	I felt good about most of the math in this project.	A lot of the math in this project was too hard for me to do alone.
I understood the math problems and did not need help to complete the problems.	I understood most of the math problems but needed a little help to solve some of the problems.	I understood some of the math problems but needed help to solve most of the problems.
I used many strategies to solve the math problems efficiently.	I needed a little help using the best strategies for solving some of the math problems.	I had trouble knowing what strategies to use to solve many of the math problems.
I am sure that I am ready for a harder math project.	I want more time practicing similar math problems.	I feel I need assistance to complete similar math problems.

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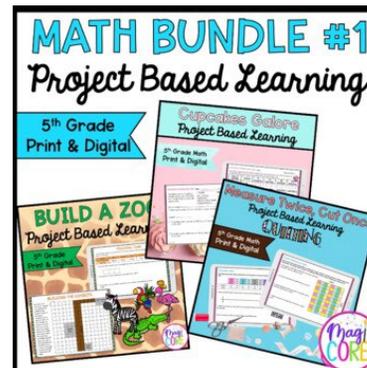
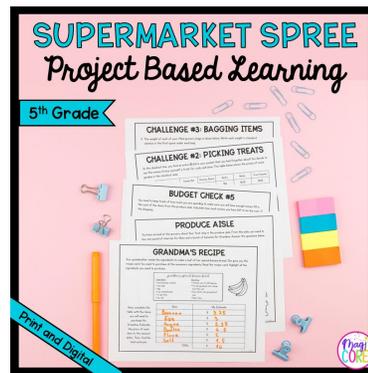


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