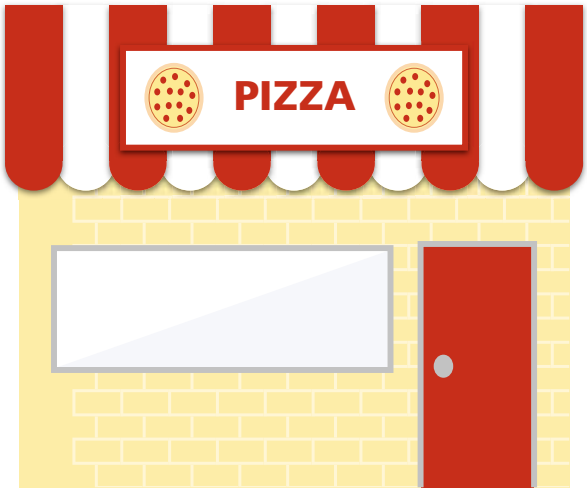
Miranda W. Leung and Terri L. Kurz



Pizza parlor mathematics

What is more fun than having pizzas, games, and prizes that include math? This set of problems relates to typical experiences that children have at pizza restaurants with arcade games and reveals some mathematics behind the pizza, games, tokens, and prizes.

Grades 5–6

WEEK 1

Andy and Amy are going to order pizza for their respective birthday parties. For every 6 guests at Andy's party, he will order 2 large pizzas. Amy will order 4 large pizzas for every 11 guests that are coming to her party. If each guest gets the same number of pieces, at which party can you get more pizza if all the pizzas are the same size and are sliced into equal pieces? Use a drawing to explain your solution. How can Andy change his ratio to align with Amy's? What would Amy have to do to have the same ratio as Andy?

WEEK 2

Scott really likes geometry, so every time he orders a pizza, he figures out the surface area of each slice. Scott orders a large 18-inch (in diameter) pizza that has 8 slices. If each slice is exactly the same size, what is the surface area of 1 pizza slice? What surface area of the pizza has Scott eaten if he eats 5 slices?

WEEK 3

A mother of 4 children has a certain number of game tokens. She gives one child 7 tokens (or 14% of the total number of tokens). She divides the remaining tokens among her other children: Yuki gets 9/25, Ming receives 20%, and Kane receives 0.3 of the total number of tokens. How many tokens did the mother have? How many tokens did each child receive?

WEEK 4

Your favorite pizza parlor offers 2 types of crust: Pan pizza crust is rectangular, and traditional pizza crust is circular. The extra-large pan pizza measures 16 × 20 inches. The extra-large traditional pizza has a 20-inch diameter. The prices for both pizzas are the same. Which pizza is a better value? Explain. What would the diameter have to be so that the pizzas have the same area? Does your answer change your response to which pizza is a better value?

Miranda W. Leung, **mwleung@asu.edu**, attends Barrett, the Honors College at Arizona State University, majoring in Elementary Education (STEM). **Terri L. Kurz**, **terri.kurz@asu.edu**, an associate professor at Arizona State University at the Polytechnic campus in Mesa, teaches mathematics content and methodology. Edited by **Sandra M. Linder, Ph.D.**, **sandram@clemson.edu**, an assistant professor of early childhood mathematics education at Clemson University in Clemson, South Carolina. Email problem collections for the editor to consider for future Math by the Month columns. See submission guidelines for all departments at **www.nctm.org/tcmdepartments**. Email creative solutions and adapted problems to **tcm@nctm.org** for potential publication, noting Readers Exchange in the subject line.

Grades 3–4

WEEK 1

You and a friend are organizing tokens used to play arcade games. Your friend lines up his tokens in an array that looks like the one to the right. How many different expressions can you write using equal groups to represent the array? To show how the array represents an expression that you wrote, make a drawing dividing up the array into equal groups.

WEEK 2

Jane's scores						
Ball	1	2	3	4	5	6
Score	10	10		10	10	20
Jim's scores						
Ball	1	2	3	4	5	6
Score	30	20	10	20	10	10

Jane and Jim decide to compare Skeeball scores when they realize that they have the same total score. They had both recorded their scores for all 6 balls, but Jim accidently spilled juice on the recording sheet. What did Jane roll for her third ball? Come up with 2 different methods of solving this problem and explain both methods.

WEEK 3

Pretend that a sheet of notebook paper is a rectangular pizza. How many different ways can you divide the pizza into 6 equal pieces by folding the paper (or by drawing lines)? How many slices would compose half the pizza? What fractional part of the pizza is 1 piece? Repeat the process for other numbers, such as 8 and 12. How could you divide the pizza into 5, 7, or 11 equal parts? Why do you think pizza is not commonly divided into 5, 7, or 11 equal parts?

WEEK 4

Before leaving the pizza parlor, you exchange your tickets for some prizes. You exchange 305 tickets for a baseball. You get 3 bouncy balls by exchanging 27 tickets for each. You get 2 lollipops by exchanging 8 tickets for each. You get 2 fake bugs for 8 tickets each. You have 4 tickets left. How many total tickets did you have before you traded them for prizes?

K–Grade 2

WEEK 1

A pizza restaurant has a game that produces 3 tickets every time it is played. June wants to win a prize that costs 25 tickets. How many times will June have to play the game to win the prize? Draw a picture to support your explanation.

WEEK 2

You decide to stack game tokens for fun while waiting for your meal to be ready. How many tokens or coins can you stack in 15 seconds? Compare your answer with your classmates' answers. Who has the tallest stack of tokens? Make a picture graph to show your answer. If the time doubles to 30 seconds, will your stack be twice as big? Explain and test your prediction.

WEEK 3

You are playing the Storm Stopper game; the light stops on a circle indicating the number of tickets you win. The light stops at number 8 twice, at number 5 twice, and at number 2 once. How many tickets will you win from this game? Will you have enough tickets for a prize that costs 30 tickets? Explain.

WEEK 4

After your mother picks you up from school at 2:30 p.m., she wants to take you out for pizza. It takes 15 minutes to get to the restaurant. You chat while you wait 10 minutes for the pizza and drinks. You eat for 20 minutes. You spend 30 minutes playing games and exchanging your tickets for some prizes. What time do you leave the restaurant? Use drawings (perhaps of a clock) to support your explanation.