

# Math Menu Mogul: Designing Your Dream Restaurant with Arithmetic

**Grade Level:** 7

**Subject:** Mathematics (Arithmetic Focus)

**Time Allotment:** 2-3 hours (can be split over multiple sessions)

## Introduction (15 mins)

Have you ever dreamed of opening your own restaurant? What kind of food would you serve? What would it look like? Running a successful restaurant isn't just about great food and cool decor; it requires a lot of math! Today, we're going to use arithmetic skills – like decimals, percentages, multiplication, and addition – to plan key parts of your very own dream restaurant.

## Activity 1: Menu Math Mania (45 mins)

Every restaurant needs a menu! Let's figure out how to price items.

1. **Choose 3 Signature Dishes:** Decide on three main dishes you'd serve (e.g., Supreme Pizza, Gourmet Burger, Special Salad).
2. **Estimate Food Cost:** Research or estimate the cost of the ingredients for one serving of each dish. (Example: Burger - Bun \$0.50, Patty \$1.50, Cheese \$0.30, Toppings \$0.70 = Total Cost \$3.00). Write these down.
3. **Calculate Menu Price:** Restaurants usually mark up food costs significantly to cover other expenses (rent, staff, electricity) and make a profit. A common strategy is to make the food cost about 30% of the menu price. To find the menu price, divide the food cost by 0.30 (or 30%).  
*Example:  $\$3.00$  (Food Cost)  $\div 0.30 = \$10.00$  (Menu Price).* Calculate the menu price for your three dishes. Round prices to make them look appealing (e.g., \$9.99 or \$10.50).
4. **Add Sales Tax:** Let's pretend the local sales tax is 7%. If someone orders all three of your signature dishes, what would their subtotal be? Now, calculate the sales tax (Subtotal  $\times 0.07$ ). What is the final bill, including tax? (Subtotal + Sales Tax).

## Activity 2: Floor Plan Finances (45 mins)

Now, let's think about the restaurant layout using graph paper. Each square on your graph paper represents 1 square foot.

1. **Design Your Space:** Draw a simple rectangular outline for your restaurant's dining area. Let's say it's 20 feet wide and 30 feet long. What is the total square footage (Area = Length  $\times$  Width)?
2. **Place Tables:** A small square table (2 seats) might need a 4ft  $\times$  4ft space (including chairs). A larger rectangular table (4 seats) might need 5ft  $\times$  6ft. Draw at least 5 tables on your floor plan.
3. **Calculate Table Area:** Calculate the total square footage used by your tables.
4. **Calculate Seating Capacity:** How many customers can you seat at once?
5. **Cost of Furnishing:** Imagine each small table costs \$150 and each large table costs \$250. Calculate the total cost for your tables.

## Activity 3: Startup Budgeting (30 mins)

Let's estimate some initial costs. Use addition and multiplication.

1. **Kitchen Equipment:** Oven (\$2000), Fridge (\$1500), Fryer (\$500). What's the total?
2. **Dining Room:** Add your total table cost (from Activity 2) to the cost of chairs (estimate \$50 per seat needed – use your seating capacity).
3. **Initial Food Order:** Estimate \$1000 for the first big grocery run.
4. **Decor & Signs:** Estimate \$800.
5. **Calculate Total Startup Cost:** Add up the costs from steps 1-4.

## Assessment & Closure (15-30 mins)

**Review Your Restaurant Plan:** Present your menu with prices (including tax calculation for the three items), your floor plan sketch showing table layout and square footage calculations, and your startup budget. Explain how you used arithmetic (addition, multiplication, percentages, decimals) in each step.

### Discussion:

- Which calculations were easiest? Which were most challenging?
- How does math help a restaurant owner make decisions?
- Can you think of other ways math is used in a restaurant (e.g., employee wages, scheduling, tracking inventory)?

**Wrap-up:** Great job designing your restaurant concept! You used essential arithmetic skills to tackle real-world problems like pricing, space planning, and budgeting. Math really is everywhere, even in the delicious world of food!

## Differentiation Suggestions:

- **Support:** Use simpler numbers for costs and percentages (e.g., 50% markup instead of 30%, sales tax of 10%). Focus on addition and multiplication before introducing percentages. Provide pre-filled cost estimates.
- **Challenge:** Add more complex budget items (rent, utilities, salaries). Calculate profit margins. Design the kitchen layout with specific equipment dimensions. Calculate discounts on bulk food orders (using percentages). Use spreadsheet software for budgeting. Research actual local costs for ingredients and equipment.