Lesson Plan: The Entrepreneur's Challenge - Launching a Food Truck

Materials Needed:

- Computer with internet access (for research)
- Calculator (or spreadsheet software like Google Sheets/Excel)
- Graph paper (1/4 inch scale is ideal)
- Pencil and ruler
- Notebook or word processor for creating the business plan

Lesson Plan Details

I. Learning Objectives (The Goal)

By the end of this lesson, the student will be able to:

- Apply mathematical concepts (percentages, linear equations, area, and scale) to a real-world business scenario.
- Research and calculate the startup, fixed, and variable costs of a small business.
- Determine a break-even point to understand when a business becomes profitable.
- Design a functional space using scale drawings and area calculations.
- Synthesize research and calculations into a clear and creative business pitch.

II. Introduction & Hook (5-10 minutes)

Teacher: "Have you ever seen a popular food truck and wondered how much money it actually makes? Or what it would take to start one yourself? Today, you're not just a math student; you're an entrepreneur. Your challenge is to design a food truck business from the ground up. You'll choose the food concept, design the layout, and most importantly, do the math to see if your idea could actually be profitable. Let's start with the fun part: If you could open any food truck, what kind of food would you sell?"

(Discuss the student's idea. This gets them invested immediately and provides the theme for the entire project.)

III. Guided Instruction: The Math Behind the Business (15-20 minutes)

Teacher: "Every great business idea needs a solid financial plan. Let's break down the key numbers you'll need to figure out."

1. **Startup Costs:** "These are the one-time expenses to get your doors open. The biggest is the truck itself! You'll also need equipment, initial permits, and branding (like a logo). Your first task will be to research the average cost of a used food truck and essential kitchen equipment for your specific food concept."
2. **Fixed vs. Variable Costs:** "Now let's talk about ongoing costs."
    - **Fixed Costs:** "These are the bills you have to pay every month, no matter how much food you sell. Think insurance, cell phone/internet for taking orders, and storage space for the truck. Let's brainstorm a list."
    - **Variable Costs:** "These costs change based on how much you sell. The biggest one is 'Cost of Goods Sold'—the cost of all the ingredients for one serving of your food. For example, if you sell tacos, what's the cost of the tortilla, meat, cheese, and salsa for ONE taco? You'll also have paper goods (plates, napkins) and fuel for the truck."

3. **The Break-Even Point:** "This is the most critical number for a new business. It's the moment where you've made enough money to cover all your costs. You aren't losing money, but you aren't making a profit yet. The formula is simple but powerful:"

   Break-Even Point (in units sold) = Total Fixed Costs / (Price per unit - Variable Cost per unit)

   "The part in the parentheses (Price - Variable Cost) is called your 'Contribution Margin.' It's the amount of money from each sale that 'contributes' to paying off your fixed costs. We'll calculate this together for your business."

IV. Main Activity: The Food Truck Challenge (60-90 minutes)

Teacher: "Okay, entrepreneur, it's time to build your business plan. We'll tackle this in three parts."

Part 1: The Concept & The Menu (15 minutes)

Solidify your food truck idea. Give it a catchy name. Then, create a simple menu with 3-5 items. For each item, set a price you think is fair. Then, do some quick research to estimate the **variable cost** (the cost of ingredients) for each item you sell. Try to be realistic!

- **Example:** "Awesome Tacos" sells a taco for $4.00. You calculate the ingredients cost $1.50 per taco. Your variable cost is $1.50.

Part 2: The Financials (30 minutes)

Using a notebook or spreadsheet, calculate the following for your business. Use real-world estimates by searching online (e.g., "cost of food truck insurance," "used food truck for sale," "cost of commercial deep fryer").

1. **Startup Costs:** List at least 5 one-time startup costs and find a total. (e.g., Truck, cooking equipment, permits, initial inventory, logo design).
2. **Monthly Fixed Costs:** List at least 3 monthly fixed costs and find a total. (e.g., Insurance, phone/payment system, storage).
3. **Break-Even Analysis:**
   - Choose your most popular menu item.
   - Use the prices and costs you determined in Part 1.
   - Calculate your break-even point using the formula: **Fixed Costs / (Price - Variable Cost)**.
   - **Answer this question:** "How many [your menu item] do I need to sell each month just to cover my bills?"

Part 3: The Layout (15-20 minutes)

A typical food truck is about 16 feet long and 7 feet wide on the inside. On your graph paper, draw the floor plan of your truck using a scale (e.g., 1 square = 1 square foot). You must creatively and efficiently fit in:

- A service window
- A prep counter
- A cooking area (stove, grill, or fryer)
- A refrigerator
- A sink
- Storage space

Calculate the total square footage of your equipment. Does it all fit? This is a real-world geometry

and problem-solving challenge that all food truck owners face!

V. Assessment: The Investor Pitch (10-15 minutes)

Teacher: "Now it's time to convince me, your 'investor,' that your business is a great idea. Present your food truck concept. You have 5 minutes to pitch your plan. Be sure to include:"

1. The name of your truck and your food concept.
2. Your flagship menu item, its price, and its variable cost.
3. Your estimated monthly fixed costs.
4. **The magic number:** Your monthly break-even point. Explain what it means and how you plan to reach it.
5. Briefly show your truck layout design and explain why it's efficient.

(This serves as a summative assessment. Evaluate the student on the clarity of their explanation, the accuracy of their calculations, and the creativity and feasibility of their overall plan.)

VI. Differentiation & Extension Activities

- **For Support:** Provide a pre-made spreadsheet template with formulas already input. Offer a list of websites with average costs for equipment and services to simplify research. Work through the break-even calculation with a sample business first.
- **For a Challenge (Extension):**
  - **Profit Goals:** "If you want to make a $4,000 profit in a month, how many units do you need to sell?" (Formula: (Fixed Costs + Desired Profit) / (Price - Variable Cost)).
  - **Marketing Plan:** Develop a marketing budget (as a percentage of projected sales) and brainstorm 3 ways to advertise your truck.
  - **Scaling Up:** What would the financial and logistical challenges be in adding a second truck to your business? Create a plan for expansion.