Math Lesson Plan: Keeton's Arcade Adventure

Student: Keeton (Age 9, Auditory Learner)

Subject: Math (Area and Perimeter)

Dates: August 18 - August 22, 2026

Weekly Focus: This week, we will move beyond simply defining area and perimeter and apply these concepts in a fun, creative project. Keeton will design his own 2D video game level, making mathematical decisions about the size and layout of different zones. The week culminates in an audio presentation where he plays the role of a game developer explaining his creation.

Materials Needed:

- Tablet or computer with internet access
- Headphones (optional, but great for auditory focus)
- ¼ inch grid paper (several sheets)
- Pencils, eraser, and colored pencils or markers
- A voice recording app on a phone or computer (like Voice Memos or Audacity)
- **Online Resources:**
  - Khan Academy videos on perimeter and area
  - Numberock math music videos (e.g., "Area and Perimeter Song")
  - Online Geoboard (e.g., from Math Playground or Toy Theater)

Oklahoma Academic Standards (OAS) for Mathematics (Grade 4)

- **4.GM.2.1:** Understand the concepts of area and perimeter. Find the perimeter of a polygon and the area of a rectangle.
- **4.GM.2.2:** Solve real-world and mathematical problems involving perimeter and area of rectangles.
- **4.N.1.5:** Solve multi-step real-world problems requiring the use of addition, subtraction, and multiplication.

Learning Objectives

By the end of this week, Keeton will be able to:

- Verbally define area and perimeter and explain the difference between them.
- Accurately calculate the perimeter of polygons and the area of rectangles.
- Calculate the area of a composite shape by breaking it into smaller rectangles.
- Apply these mathematical skills to a creative design project.
- Articulate his problem-solving process and the real-world relevance of his calculations in an audio recording.

Daily Lesson Plan

Day 1: Monday, August 18 - Mission Briefing: Understanding Perimeter

- **Warm-up (10 mins):** Listen to a short, catchy "Perimeter Poem" together. Ask Keeton to tap out the beat for each line. Discuss what the poem is describing. *Example: "To find the perimeter, all around, just add up the sides you've found!"*
- **Instruction & Guided Practice (20 mins):**
    1. Watch a short Khan Academy video on "Introduction to Perimeter." Pause and discuss. Emphasize the key idea: perimeter is the *distance around* a shape, like a fence or a border.
    2. Open the online geoboard. Together, create a few different polygons (squares, rectangles, irregular shapes). As the teacher, you "think aloud" while counting the units around the first shape.
    3. Give Keeton control. Ask him to create a shape and then talk you through how he is calculating its perimeter.
- **Project Work (15 mins):** "The Game Map." Introduce the week's project: designing a video game level! Today, Keeton will decide on a theme (e.g., "Alien Zoo Escape," "Deep Sea Treasure Hunt") and draw the outer border of his entire game world on grid paper. He will then calculate the total perimeter of his world and write it at the top of his map.
- **Wrap-up (5 mins):** Ask Keeton to explain, in his own words, what he did today. "What is perimeter, and how did you find the perimeter of your game world?"

Day 2: Tuesday, August 19 - Level Design: Introducing Area

- **Warm-up (10 mins):** Watch the Numberock "Area and Perimeter Song" video. Ask Keeton which part of the song was about what we learned yesterday (perimeter) and what new idea the song introduced (area).
- **Instruction & Guided Practice (20 mins):**
    1. Discuss the concept of "area" as the *space inside* a 2D shape, like tiles on a floor or grass in a yard.
    2. Use the online geoboard again. Create a rectangle. First, find the area by counting every single square inside. Then, introduce the shortcut: the formula **Area = Length × Width**. Practice this with a few different rectangles.
    3. This is a great time for auditory reinforcement: have Keeton say the formula "Length times Width" aloud each time he uses it.
- **Project Work (15 mins):** Keeton will add the first major zone to his game map. It must be a square or a rectangle. This could be the "Start Zone," a "Power-Up Room," or a "Lava Field." He will label the zone and calculate its area, writing the calculation right on the map (e.g., "Lava Field: 5x6 = 30 square units").
- **Wrap-up (5 mins):** "You're the Teacher." Ask Keeton to pretend he's a math tutor and teach you how to find the area of the zone he just created.

Day 3: Wednesday, August 20 - Area vs. Perimeter Face-Off

- **Warm-up (10 mins):** "Which one is it?" Present Keeton with verbal scenarios and have him say "Area!" or "Perimeter!"
    - "How much ribbon do I need to go around a birthday present?" (Perimeter)
    - "How much carpet do I need for this room?" (Area)
    - "How much fencing do I need for my dog?" (Perimeter)
    - "How much paint do I need to cover this wall?" (Area)
- **Instruction & Guided Practice (15 mins):** Let's explore a tricky question: "Can two different rectangles have the same area but different perimeters?" Use the online geoboard to

investigate. For example, explore a rectangle with an area of 24. (e.g., 1x24, 2x12, 3x8, 4x6). Calculate the perimeter for each. This is a fantastic activity for fostering deeper, critical thinking.
- **Project Work (20 mins):** Keeton will add two new rectangular zones to his map. For each one, he must calculate and label **both** the area and the perimeter. Encourage him to try to create two rooms that have the same area but look very different.
- **Wrap-up (5 mins):** Point to one of his new zones and ask: "If you were a character in your game, how many steps would it take to walk the border of this room? How much space do you have to run around inside it?"

Day 4: Thursday, August 21 - The Boss Level: Composite Shapes

- **Warm-up (5 mins):** Give Keeton an audio math riddle. "*I am a shape made of two rectangles pushed together. To find my total area, what is your clever measure?*" (Answer: Break me apart!)
- **Instruction & Guided Practice (20 mins):**
  1. On the geoboard or grid paper, draw a composite shape (like an L-shape). Talk through the challenge: there's no simple "Length x Width" formula for the whole thing.
  2. Demonstrate the strategy: draw a line to break the complex shape into two simple rectangles.
  3. Calculate the area of the first rectangle. Calculate the area of the second. Then, add them together to find the total area. Work through 2-3 examples together, with Keeton talking you through the final one.
- **Project Work (20 mins):** It's time for the "Boss Room"! Keeton will design and add one final, large room to his map that is a composite shape. He must show his work by drawing a dotted line to break it apart and labeling the area of each part before adding them for a total.
- **Wrap-up (5 mins):** Ask Keeton to be a "strategy guide" and explain his method for defeating the challenge of the L-shaped room's area calculation.

Day 5: Friday, August 22 - Developer Showcase!

- **Warm-up (10 mins):** Keeton puts the finishing touches on his map—coloring in the zones, adding fun details like traps or treasures, and making sure all his calculations are clearly labeled.
- **Project Showcase & Summative Assessment (30 mins):**
  1. **Prepare:** Briefly discuss what a "developer's log" is in game design. It’s where the creator explains their ideas and how they built things.
  2. **Record:** Keeton will create a 2-4 minute audio recording for his "Developer's Log." Using his finished map, he should:
     - State the name and theme of his game.
     - Give a tour of the different zones he created.
     - Clearly explain how he calculated the perimeter of his entire game world.
     - Pick one rectangular room and one composite room and explain, step-by-step, how he found their areas.
     - Answer the question: "Why would a real game designer need to know this math?"
  3. **Review:** Listen to his audio recording together. Celebrate his fantastic work and creativity!
- **Wrap-up (10 mins):** Fun discussion. "What was your favorite part of being a game designer this week? What was the most challenging math problem you solved?"

Differentiation and Support

- **For Extra Support:** If Keeton struggles with the grid paper, use physical 1-inch square blocks

or LEGO bricks to build the shapes first. This provides a tactile way to count area and perimeter before moving to paper. If composite shapes are too difficult, focus on mastering area and perimeter of rectangles only.

- **For an Extra Challenge:** Introduce a budget. "Tile for the lava fields costs $5 per square unit. The protective wall around it costs $10 per unit of length. What is the total cost for the lava field zone?" Or, challenge him to design a room with a specific area (e.g., "Create a treasure room that has an area of exactly 48 square units").