

Objective

By the end of this lesson, the student will gain a deeper understanding of pre-algebra concepts through engaging problem-solving activities and will enhance their critical thinking skills using the Art of Problem Solving (AoPS) methodology.

Materials and Prep

- Access to Alcumus (Art of Problem Solving platform)
- Notebook and pencil for taking notes and working through problems
- Access to Richard Rusczyk's videos or articles for reference
- Timer for timed challenges (optional)

Before the lesson, ensure that the student has logged into Alcumus and is familiar with the basic navigation of the platform. Review any recent topics covered in pre-algebra to provide context for the activities.

Activities

- **Problem of the Day:** Start with a challenging problem from Alcumus that relates to recent topics. Give the student 10-15 minutes to solve it independently, then discuss the solution together.
- **Creative Problem Solving:** Have the student create their own math problem based on a real-life scenario (e.g., planning a party, budgeting for a trip). They will then solve it and present their solution process.
- **Math Art:** Integrate art by having the student create a visual representation of a mathematical concept (e.g., graphing a quadratic equation, tessellations). This will help them see the beauty of math in a different light.
- **Timed Challenge:** Select a set of problems from Alcumus and set a timer. The goal is to solve as many as possible within the time limit. This encourages quick thinking and reinforces learned concepts.

Talking Points

- "Remember, math is not just about getting the right answer; it's about understanding the process to get there!"
- "When creating your own problem, think about something you enjoy or are curious about. This makes math more relatable!"
- "Art and math go hand in hand. Have you ever noticed patterns in nature? That's math in action!"
- "Timed challenges can be tough, but they help us learn to think on our feet. Don't worry about being perfect; focus on improving!"
- "Richard Rusczyk emphasizes that problem-solving is a skill. The more you practice, the better you'll get at it!"