Objective

By the end of this lesson, Georgia will understand the historical significance of pyramids, particularly the Great Pyramid of Giza, and will apply mathematical concepts to calculate the volume and surface area of a pyramid, enhancing her skills in both history and math.

Materials and Prep

- Paper and pencil for calculations and notes
- Access to a calculator (if needed)
- Internet access or a library for research (optional)
- Knowledge of basic geometric formulas for pyramids (volume and surface area)
- Familiarity with key historical figures and events related to ancient Egypt

Activities

- **Research and Presentation:**

  Georgia will research the Great Pyramid of Giza, its construction, and its historical significance. She will create a short presentation to explain her findings, focusing on who built it, why, and how it has influenced modern architecture.

- **Math Application:**

  Using the dimensions of the Great Pyramid (approximately 146.6 meters tall and a base of 230.4 meters), Georgia will calculate the volume and surface area using the formulas: Volume = (1/3) × Base Area × Height and Surface Area = Base Area + (1/2) × Perimeter × Slant Height. She will share her results and discuss any challenges faced during calculations.

- **Pyramid Model:**

  Georgia will create a simple model of a pyramid using paper or cardboard. She will measure and cut out the base and triangular sides, applying her math skills to ensure the dimensions are proportionate. This hands-on activity will help her visualize the structure of pyramids.

Talking Points

- "Did you know that the Great Pyramid of Giza was the tallest man-made structure in the world for over 3,800 years? It really shows how advanced ancient Egyptian civilization was!"
- "When we calculate the volume and surface area of a pyramid, we’re not just doing math; we’re connecting with the architectural genius of ancient builders who used these principles to create lasting monuments."
- "Think about the resources and workforce needed to build a pyramid. It wasn't just about stone and labor; it involved complex organization and planning. How does that compare to large projects today?"
- "The design of pyramids has influenced many modern buildings. Can you think of any structures today that mirror the pyramid shape or have been inspired by them?"
- "Understanding the geometry of pyramids can help us appreciate their beauty and functionality. How do you feel about the relationship between math and art in architecture?"