



## *Drexel-SDP GK-12 LESSON*

- Lesson Title and Identifier:

Title: Visualizing Math: Geometry, Art, and Design

Identifier: 2.2

- Module: Math
- Subject Area (Unit): Math
- Concept:  
Polygon, Repeating pattern, pyramids

- Objectives:

This exercise will review geometrical concepts with the students and discuss where these forms are present

- Keywords: Polygon, pyramids, buildings, shapes
- PA Academic Standards:  
**Math** 2.3 Measurement and Estimation  
2.9 Geometry
- Grade Level: 6th
- Setting/Group Size: 30 students
- Duration/Time Required: 1 class period
- Materials List (include safety equipment if applicable)

Chalkboard and student answers

Pencil

Paper

Compass and protractor

Photos of famous designs (Philadelphia, Pyramids)

- **Methods and Procedure:**

Step 1: Discuss famous buildings in the Philadelphia area. Discuss the work of architectural engineers at this point. Move the discussion to the pyramids. (Great, red, and bent pyramids) What are the similarities between the complex at Giza and the city of Philadelphia? How are they different?

Volume discussion: The volume of the Great Pyramid of Giza is less than the volume of the Great Pyramid of Cholula, but the Great Pyramid of Cholula is shorter. How could this be possible?

Engineering discussion: Why would buildings area shaped like pyramids? Why is the Bent Pyramid bent?

Step 2: Ask the students to compare the pyramids (writing assignment).

Step 3: Discuss the differences between the pyramids, which introduces the concepts of angles and volumes.

Step 4: Extend the discussion to circles and to city layouts. Show examples of some layouts.

Step 5: As a take home assignment, have the students design their own city layout. Have them denote the angles they used and why.

- **Assessment**

You will be evaluated on a scale from 0 to 4 on:

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Participation

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Task Completion

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Quality of Analysis

- **References & Web Sites:**

Fig 1. Independence Hall - <http://en.wikipedia.org/wiki/Philadelphia>

Fig 2. Philadelphia Museum of Art - <http://en.wikipedia.org/wiki/Philadelphia>

Fig 3. 1888 Map of Philadelphia - <http://en.wikipedia.org/wiki/Philadelphia>

Fig 4. Map of the Giza Complex (Top View) -

[http://en.wikipedia.org/wiki/Great\\_Pyramid\\_of\\_Giza](http://en.wikipedia.org/wiki/Great_Pyramid_of_Giza)

Fig 5. Great Pyramid of Giza - [http://en.wikipedia.org/wiki/Great\\_Pyramid\\_of\\_Giza](http://en.wikipedia.org/wiki/Great_Pyramid_of_Giza)

Fig 6. Sneferu Bent Pyramid - [http://en.wikipedia.org/wiki/Bent\\_pyramid](http://en.wikipedia.org/wiki/Bent_pyramid)

Fig.7. Red Pyramid - [http://en.wikipedia.org/wiki/Red\\_Pyramid](http://en.wikipedia.org/wiki/Red_Pyramid)

Fig 8. Only a fraction of a staircase on one side of the Great Pyramid of Cholula has been restored to its former glory - [http://en.wikipedia.org/wiki/Great\\_Pyramid\\_of\\_Cholula](http://en.wikipedia.org/wiki/Great_Pyramid_of_Cholula)

Fig 9. Model of the Great Pyramid of Cholula. -

[http://en.wikipedia.org/wiki/Great\\_Pyramid\\_of\\_Cholula](http://en.wikipedia.org/wiki/Great_Pyramid_of_Cholula)

- **Authors**

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