Learning from Miami

Title: Geometry and Architecture in the Real World Unit Plan

Grades: K-5 (can be adapted to any grade)

Subject Areas: Social Studies, Language Arts, Math, Technology

Overview of lesson:

1. Students will work in groups to create a drawing of a "school" on-line.
2. Students will participate in an Internet search of vocabulary relating to architecture and geometry.
3. Students will be applying geometry skills to building a simple architectural structure.
4. Students will understand that math is all around us.
5. Students will use the following "Learning from Miami" link to introduce lesson: http://learningfrommiami.org/?p=425

Objectives:

Students will do the following:

- Conduct an internet search for geometry and architecture vocabulary
- Build a school building using geometric shapes
- View a video about geometry and architecture and respond to writing prompts orally.
- Students will build a school building on-line

Common Core Standards:

http://www.fldoe.org/schools/ccc.asp

http://www.corestandards.org/

Materials:

Computer with Internet access, paper, pencil, poster board, scissors and glue, color pencils scissors

Procedures:

1. Building Vocabulary of Architecture & Geometry

Students will view the following Learning from Miami website resource link:

http://learningfrommiami.org/?p=425 and note the geometrical patterns of the Plymouth Hotel. This link will be used to introduce the lesson and activate prior knowledge.

Students will participate in an Internet search of Vocabulary relating to architecture and geometry as a class on the smartboard or in small groups/individually on computers. The definitions for the architecture vocabulary may be found at

http://www.bcsd.k12.ny.us/middle/michalek/Frontpage Albany 2002A/architecture_vocabulary.htm.

The definitions for the geometry vocabulary may be found at:

http://math.youngzones.org/geometry_vocabulary.html.

Students will create a picture dictionary of at least 5-10 vocabulary words found during their Internet search activity. Younger students can simply view and discuss orally.

2. Virtual Architect

Students will become 'Virtual Architect's' on line using the following website:

http://mathbydesign.thinkport.org/default.aspx?skipTo=flossville&cb=1368291708119

Depending on their academic level students can work in pairs or independently to build a school building on-line.

3. Video and Discussion

The class will view a YOUTUBE video to get background information on how to make connections between geometry and architecture. The video focuses on a high school geometry class design project. Students at an elementary can hold a whole-class discussion about the video and its relation to building, designing and creating structures. The following is the video link:

http://www.youtube.com/watch?v=QbeQpSkQUnw

The following questions are optional depending on the level of understanding of the students:

• What did you learn about geometry from the video?
• What did you learn about architecture from the video?
• How are geometry and architecture related?

- Have students to respond to the following prompts:

• What are the connections between mathematics and other sciences?
• What role does imagination play in mathematics?
• What role does imagination play in architecture?
• What role does creativity play in architecture?
• What role does creativity play in mathematics?
• How are words used in similar ways in architecture and mathematics?
• What are the connections between architecture and mathematics?
• What math idea needs to be used in creating a scale model?
• What math idea needs to be used in perspective drawing?
• What math idea needs to be used in creating a floor plan?
• What math idea needs to be used in developing cost estimates?

4. Using What was Learned:
   - Students should work in groups of fours to build a "school building" using blocks to create a sample model or pattern blocks to create a sample on poster board.
   - The school can include styles that have been previously taught such as, Art Deco, Mediterranean and/or Moorish Revival.
   - Students should brainstorm ideas in their groups and then make one rough draft drawing of their ideas compiled.
   - Finally, the students will use the on-line website to experiment and create their virtual building.

Enrichment Extension Activities:

Real World Research
Ask students to interview an architect about the connections between architecture and mathematics. If possible, invite an architect to visit the classroom and share his or her work with the class.

Ell Strategies: peer tutor, visuals and translation

Remediation: Hands-on activity, peer tutor, guest speaker to clarify questions

Resources:

Common Core Standards:

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http://www.corestandards.org/

Learning from Miami website resource link:

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www.learningfrommiamiorg