

Learning from Miami

Title: Geometry and Architecture in the Real World Unit Plan

Grades: 9-12 (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 'High School of the future' and produce one three-dimensional room model.
2. Students will participate in an Internet search of Vocabulary relating to architecture and geometry.
3. Students will use the following "Learning from Miami" link to introduce lesson:
<http://learningfrommiami.org/?p=425>

Common Core Standards:

<http://www.fldoe.org/schools/ccs.asp>

<http://www.corestandards.org/>

Objectives:

Students will do the following:

- Conduct an internet search for geometry and architecture vocabulary
- Build a Virtual Park on-line
- View a video about geometry and architecture and respond to writing prompts
- Build a High School of the future that takes in account the building and styles around it.

Materials:

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

Steps for Implementation:

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.

The definitions for the architecture vocabulary may be found at [http://www.bcsd.k12.ny.us/middle/michalek/Frontpage Albany 2002A/architecture vocabulary.htm](http://www.bcsd.k12.ny.us/middle/michalek/Frontpage%20Albany%202002A/architecture_vocabulary.htm).

The definitions for the geometry vocabulary may be found at http://math.youngzones.org/geometry_vocabulary.html.

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>

3. Video and Discussion Questions

The class should will view the following 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.

<http://www.youtube.com/watch?v=QbeOpSkQUnw>

Discussion Questions:

- 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 you learned

- Students should work in groups of fours to build a "High School of the Future".

- The school must 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 rough draft drawings.
- The final drawing draft should be completed on poster board.
- Finally, the students should make a three-dimensional figure of one classroom

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, translation, visuals, computer-assisted instruction

Remediation Strategies: Hands-on activity, group project, oral presentation

Resources:

Common Core Standards:

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<http://www.corestandards.org/>

Learning from Miami website resource link:

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