

Integrated lesson plan in Math-itecture  
Grade level 5-7  
technology or math class  
by Jonathan

Objective: find the golden section in architecture to answer the question  
“**Does the golden section really appear in everyday life?**”

Motivation: create a piece of digital art on the computer

Materials: P.C.s, pencil, paper, calculator, metric ruler

Some background material is necessary before teaching this lesson. Students should be familiar with ratios and fractions. They should also be aware that golden section is a rectangle with a shape held by ancients to possess magical powers. They should know that the ratio of the golden section is about 1:1.6.

Have students browse the website *greatbuildings.com* and choose their favorite structure to analyze and duplicate on the computer.

Give the students several structures to search for and look at, then choose one to work with. Suggestions: United Nations, Notre Dame, Parthenon, Sears Tower, Twin Towers, anything else that will be easy to find.

Poll the class to find what they've chosen to work with. Instruct them to copy a photo of it and paste it to an MS paint file:

1. Right-click on it
2. Select copy
3. Open a new file in MS Paint
4. Right-click and select paste

The students will use the rectangle tool to outline shapes in the photo. They should select a dark color to work with. Instruct them to start at a corner and completely cover a section of the structure with a rectangle. After they use the ruler to record both the height and width in millimeters, dividing the larger number by the smaller with a calculator gives the result. Pose the question:

**Is this number close to the ratio of the golden section?**

If the number is between 1.5 and 1.7, they should color the rectangle yellow with the fill-in option (they will need to select the inkbottle icon from the menu). Instruct the students to outline as many surfaces or parts of their building as they can. Only the rectangles with a 1.5-1.7 ratio will be light in color, identifying them as the golden sections.

Spend any remaining time decorating the rectangles, and adding details to the project. Encourage the students to experiment with the various tools in the menu and try to use them in their work. Before the class ends, have them save their file to the desktop.

The students have chosen pre-existing structure to use as a template for making digital art. In the process, they have determined whether their choice includes golden sections. After this fundamental goal is achieved, they go on to flex their own creativity by adding any details they want.