Lindita
Math-Kitecture Lesson Plan
Grade 6

Objective:

1. Students find perimeters of simple shapes and find areas by counting squares.
2. Students understand and use the formula for the area of a rectangle.

NYC Curriculum:

M2 Geometry and Measurement Concepts

M2a Be familiar with assorted two- and three-dimensional objects.

M2c Identify three dimensional shapes from two dimensional perspectives; draw two dimensional sketches of three dimensional objects.

M2d Determine and understand length, area, and volume.

Resources required:

- Math-kitecture.org
- Power Point
- Paper and pencils

Teaching activities:

Mental Starter

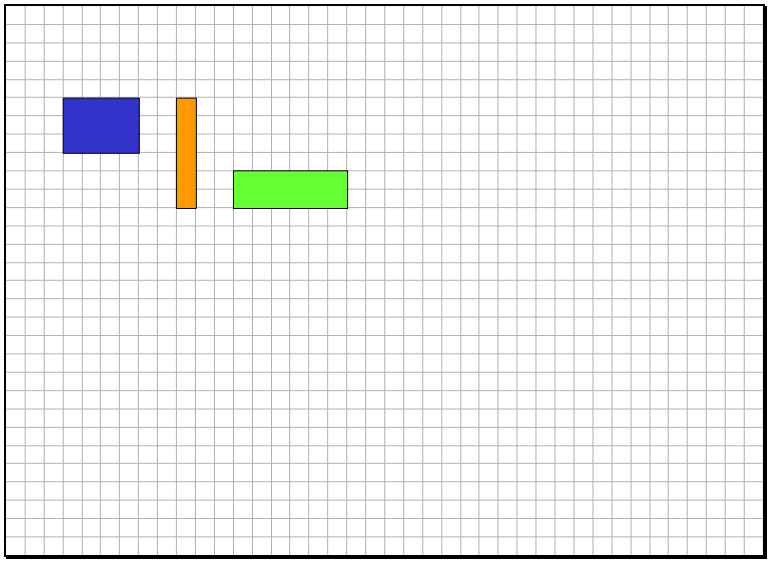
- Five random questions on conversion factors for cm to m, inch to feet, etc.
- Random multiplication tables to help with calculating the area later .

Activities

- The teacher asks questions about the units for perimeter, area and volume.

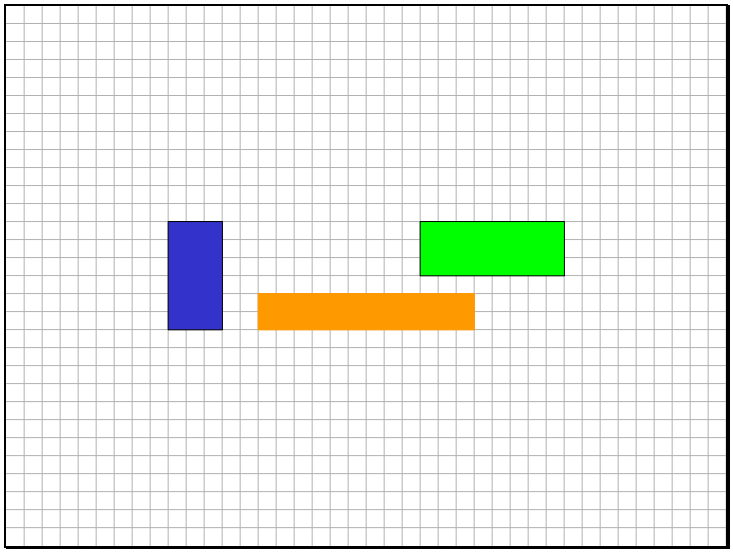
  Rectangles with a constant perimeter

  - Using Math –kitecture .com students download an MS PowerPoint graph paper template in 1/4" scale.
  - Using ¼ inch square grid paper, they draw different rectangles with the same perimeter in power Point.
    E.g. Below are some rectangles that have a perimeter of **7/2 inch**:



- Rectangles with a constant area

Using ¼ inch square grid paper, draw different rectangles with the same area.
E.g. These are some rectangles with an area of **9/8 inch^2:**



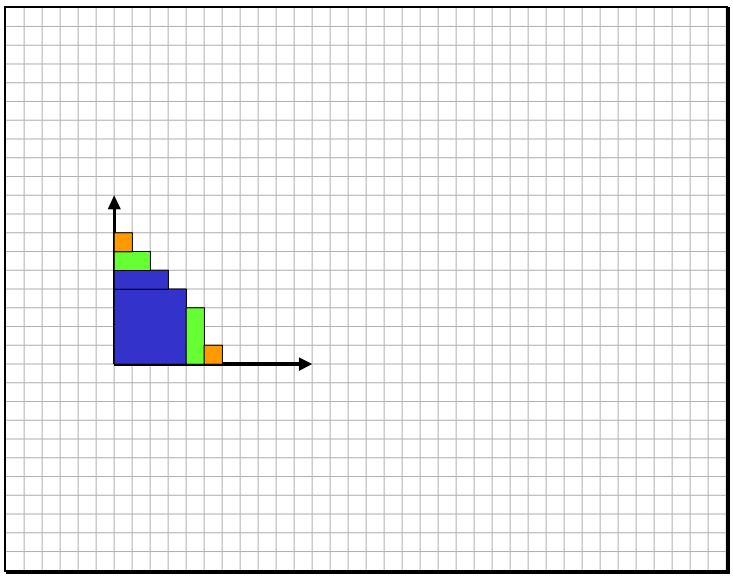
Some questions could be about:

* if only integer values are used, how many rectangles can be made?
* exploring the areas of the shapes you find,
* whether a 6x1 is different to a 1x6,
* whether you can use a rectangle measuring 5.5 x 1.5,
* what the smallest and largest areas are that can made,

Explore the areas of other shapes with other perimeters.

Graphing results

Using the rectangles with a constant perimeter of **7/2 inch**., created from the **previous task**, cut them out using Power Point and stick them on a pair of axes in the slide, i.e.:



The co-ordinates at the top right-hand corner of each rectangle represent the dimensions of each one.
They lie on the line $y = 7 - x$ or $x + y = 7$.

A further task, therefore, is for students to explore the connection between perimeters and the graphs so produced.

Maximum area

Using non-integer values, what are the dimensions of the rectangle with the greatest area?

Construct a rule that connects the perimeter with maximum area.

Can this rule be formalised?

Extension:

Explore the areas of other shapes with other perimeters

The area of trapezium, parallelogram, kite, circle and volume of a prism are all ideal extensions to these activities.