Chapter 20 Pedagogy Leader

Geometric Thinking and Geometric Concepts

* To best help our students grow we need to understand both aspects of geometry- reasoning and content.
* Shape sorts are a great way to get our students to develop geometric thinking.
* Instruction at Level 0:
  + Should involve lots of sorting and classifying
  + The primary focus at this level is seeing how shapes are alike and different.
  + Students need the opportunity to draw, build, make, compose, and take apart shapes in both two and three dimensions.
* Instruction at Level 1:
  + Focus should be on the properties of the figures.
  + Apply ideas to entire classes of figures rather than on individual models.
* Instruction at Level 2:
  + Encourage the making and testing of hypotheses.
  + Use the language of informal deduction.
* By sorting shapes, students will begin to recognize properties.
* Using assorted tiles such as: pattern blocks, mosaic puzzle, and tangrams are very beneficial with geometry.
* Having the students build three-dimensional shapes with different materials can be very beneficial to them. Examples: plastic coffee stirrers with twist ties, plastic drinking straws, and rolled newspaper rods.
* Tessellations are great for these concepts. You can use these from 1st to 8th grade. These activities can vary considerably in difficulty.
* Use a “triangle sort” where the students sort the triangles into discrete groups, instead of having to put the triangles on the board and write the definitions. (Activity 20.8)
* Remember that most geometric activities can be found online. It is sometimes easier to have the students “make” these shapes online.
* To introduce line symmetry you can have the students fold a sheet of paper in half and cut out a shape. When they open the paper, the fold line will be a line of symmetry. Another way is to use mirrors.
* With transformations have students experiment using simple shapes such as the letter L. They can draw it on a dot grid and label it L1, reflect through a line and then rotate the image ¼ and call it L2, and so on.
* To begin leaning about location, the students learn words like over, under, near, far, between, left, and right. This will give them a head start to the future when they begin thinking about location as a grid system.
* At a higher level, you can place simple shapes on a grid and the students can record the coordinates.
* Pentominoes can be very beneficial to our students learning about visualization. Pentominoes is a shape formed by joining five squares as if cut from a square grid. Lots of activities can be done with these.
* Higher-level thinkers can use block buildings on isometric grids.