Director’s Corner: What Shape?

Though counting and simple arithmetic are the most natural ways to begin engaging children in everyday math, there are four additional domains of math to consider as we aim to foster positive attitudes and build strong conceptual foundations. This semester, I’ll encourage you to go beyond asking How Many? to ask What Shape? What Patterns? How Big? and How Frequent?

Geometry is the domain of mathematics related to the question What Shape? It involves skills of recognizing and forming shapes (individually and in combination), working with spatial arrangements and symmetry, and other types of spatial reasoning. As with arithmetic, we tend to limit ourselves to simple discussions of regular shapes with young children (e.g., circle, square, and triangle), but they are curious about and capable of both noticing and creating much more interesting geometric arrangements. Consider the bilateral symmetry in the bug below and how a kindergartner might describe the shapes used to create the bug or those created by the black lines in the cool / warm color painting. As children indicate interest, they can certainly acquire a broad vocabulary of lines, two-dimensional, and three-dimensional shapes, such as zigzag, spiral, oval, trapezoid, cube, and cylinder. As we describe arrangements, we can introduce 3’s to spatial terms such as above, below, beside, behind, etc. and progress to more sophisticated vocabulary, such as horizontal, vertical, and diagonal, for kindergartners.

At school and home, we can offer a variety of enjoyable geometry activities from open-ended building explorations (e.g., with blocks, cups, etc.), to assembling puzzles, to solving tangram challenges (see image to the right). Using cookie cutters, shape stencils, and geo-boards (see image below) allows children to begin creating simple shapes that their fine motor skills might not be ready to make independently. We also practice spatial reasoning with children when putting away items and packing, since we determine placement based on the match between an object’s size and shape and the space available. Modeling the use of maps and helping children to begin mapping the spaces most familiar to them highlights the usefulness of spatial representations for navigation. The same is true for assembly diagrams, which children start using for Lego creations and other building toys.

As with arithmetic, diverse practice in the context of daily living and free play is what gradually builds positive attitudes and strong math concepts. Begin by noticing the geometry around you, both indoors and outdoors. You may observe more rectilinear (straight line) shapes with manmade objects, buildings, etc. and more curvilinear ones in nature.

Remember that the aim is to find what fascinates you and your children so that you will have fun doing developmentally appropriate spatial explorations together with increasing complexity over time.