

Four-Year-Olds Discover Meaningful Connections in Mathematics

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Personal discovery and making connections with previous knowledge are both compelling motivators for learning. Recent discussions with PreS 4s faculty reminded me that our younger students are capable of understanding concepts that adults previously considered too sophisticated for this age group. We now know that if we present these sophisticated concepts with concrete materials and in the context of current topics of study, our youngest learners' mathematical thinking grows exponentially.

When you walk into our PreS 4s classrooms this month, reptiles, birds, tropical flowers and plants abound in the dramatic play center, the sensory tables and the science center. They are the theme in many of the language and math center activities as well. Over the last few years, our math consultant Peggy McLean, has suggested several activities that have been integrated into lesson plans. Here are a few from Laura Voss-Phillips' class. I've also identified the specific strand of mathematical thinking for each because it's important to know that we try to incorporate all the math strands into each unit of study.

Measurement (area, length, perimeter, etc.) with Reptiles

Our students had the opportunity to measure the length of a real boa constrictor skin using unifix cubes. It was a time consuming process (see picture), and the class carefully counted them afterward. The snake skin was 136 cubes long!

We also discussed the difference between the concept of length and the concept of perimeter. Children used our wooden building blocks to measure the perimeter of stuffed reptiles. Then they used a Post-It to label each reptile with correct numeral for its perimeter measurement.

Geometry/Number Concept Activities

We have picture cards of various reptiles. The children match the various pattern block shapes to actually build the reptile and then sort and count the pattern blocks they used. The last part of the activity is to make graph of the number of shapes used. Think about the multiple steps in this activity, the level of concentration needed to complete each step, and the sorting, categorizing, and counting needed to complete the graph!

Another number sense activity uses Cuisenaire rods. The child builds a "snake" with Cuisenaire rods and then records the rods used on graph paper by coloring in the length of each rod with its appropriate color.

Probability

Mrs. Richer worked with pairs of children to introduce the concept of a probability graph. Then the activity is available in the math center for further exploration. Each child has a graph that categorizes reptiles and amphibians. By spinning a spinner and watching where the arrow lands, the child then places a plastic turtle or frog on the graph. Mrs. Richter will periodically ask the child to predict which part of the graph will be completed first - the reptile column or the amphibian column.

Logic and Beginning Operations (Addition)

The children have learned about the various layers of the rain forest - the forest floor, understory, canopy and emergent layer. Their task in this activity is to sort a set of rubber rain forest animals and place them on the correct rain forest layer. Next, they count the animals in each level and then record the total for each layer in the appropriate space. Lastly, they determine the sum of "animals in the rain forest" by coloring the correct number of squares on the recording paper.

Logic and Geometry

The children have been introduced to three dimensional solids (cubes and spheres) last month in the calendar math pattern. They have explored a collection of three dimensional solids (cubes, spheres, cones, pyramids and rectangular solids) in one of the math trays. Our math consultant Peggy McLean, used these now familiar solids to explain how to compare attributes using a three dimensional plastic Venn diagram. The children explored color and type of solid, made sets and easily found the solids that intersect both sets, e.g. red and cubes. The children are currently working at this activity in partners. Two friends recently made their task even more sophisticated by choosing both blue and purple for color and sphere as the solid. They were extremely proud of their accomplishment as you can see in the accompanying photo.

Teachers are asking thoughtful questions to help clarify their students' thinking. By using concrete objects, the children demonstrate their approach to a mathematical concept and the teacher can determine their level of understanding. Our students enjoy the challenge of an activity and feel successful when they can continue it independently. They encourage and inspire each other. One youngster overheard me discussing the thoughtful and careful work of two friends. She asked them, "Are you finished? Let's try to make it even harder!"