Director’s Corner: What Patterns?

Noticing patterns in the world and describing the mathematics of change is the essence of algebra, which the Khan Academy describes as “the language through which we describe patterns” and a “simple way to express a repetitive process”. According to Marshall Haith’s research, an infant as young as 2-3 months old can anticipate where objects will appear on a screen if there is a systematic pattern, such as left – right – left – right or top – middle – bottom – top – middle – bottom. We can tell that infants learn the pattern and can predict the next location because their eyes move in advance of the object appearing.

By preschool, children can remember and follow many types of patterns, starting with routines in their home life, such as take a bath - brush teeth – hear a bedtime story or sing the hello song - do the calendar – check the weather, etc. Children’s learning of such patterns is especially obvious in their protests that one parent or a substitute teacher isn’t following the routine “correctly”. Additional evidence comes from the popularity of songs with actions, such as “head, shoulders, knees, and toes”, or repetitive stories, such as “Brown Bear, Brown Bear, What Do You See? I see a red bird looking at me. Red bird, red bird, what do you see? etc.” As with other foundational math concepts, adults who draw children’s attention to patterns in the world help them begin to notice them naturally.

In school, we start with noticing patterns and predicting what will come next, all using everyday objects and situations, such as clothing designs, repeated actions in setting the table for snack (e.g., napkin-cup-napkin-cup), or up-down-up-down, etc. The next challenge is to copy and extend patterns in contexts such as stringing beads, building with blocks, playing follow the leader, etc. We also begin to use letter names to describe patterns. For example, an AB pattern has two repeating elements, such as red-blue-red-blue or clap-snap-clap-snap or eventually odd-even-odd-even. By this time in the year, kindergartners can recognize, extend, and even create much more sophisticated patterns, such as ABBC or ABAC, etc.

At home, there are many common opportunities to promote children’s interest in patterns. Both indoors and outdoors, pay attention to the designs on plants, furniture, buildings, etc. Cooking affords opportunities for repeated actions such as adding an ingredient and then stirring, and table-setting patterns have even more elements, especially for fancier meals. Card games involve patterns of numbers and suits, and most all games involve sequences of actions and turns. The enclosed “Preschoolers as Pattern Sleuths” article from Teaching Young Children offers even more ideas, as well as some children’s books that emphasize patterns. As always, aim to take the child’s lead regarding what is interesting and enjoyable, particularly in terms of using their favorite toys or pastimes as arenas for pattern play (e.g., patterns in block building, with stuffed animals, in art, with sports, etc.). Experiencing the same types of patterns in diverse contexts and different modalities (visual, tactile, auditory, etc.) will deepen children’s understanding of the core concepts.

Working with patterns gives children opportunities to practice other concepts of math as well, starting with counting pattern elements, noticing their shapes and spatial arrangements, etc. Patterns become most useful when they help children make predictions about what comes next. Helping children identify predictability in the world alerts them to regularities that they can use to organize their thinking and behavior, which then makes them more confident and likely to engage more fully.