Our final domain of mathematics to consider is **measurement**, which involves assigning a number to a characteristic so as to more easily compare objects, events, etc. We all use measurement frequently in order to buy the right size clothes, add the correct amount of ingredients in a recipe, manage our time, watch the gas gauge to plan when to refuel our cars, and so on. Professionals in a wide range of fields create specialized measurements for hardness of rocks, intensity of odors, brightness of light, amount of pressure, etc., as needed to improve the precision of their comparisons.

We first use measurement when we begin to **compare attributes** of ourselves, such as when young children announce that they are taller, faster or stronger than someone else. Our initial lessons involve direct comparison, such as standing back to back or running a race. For measurement of weight or temperature, we can sometimes hold one object in each hand to estimate which one is heavier or warmer. Sometimes we compare whole sets of objects by arranging them in a series from thickest to thinnest, darkest to lightest, longest to shortest, etc.

Once children understand the idea of comparison, we introduce units of measurement so that we can measure without the constraint of having people or objects in the same place at the same time. We start informally with common units such as steps from one place to another or paper cups-full to serve an equal amount of snack. Soon, children notice the problem with such **informal measures** because individuals will get different answers when they measure distance or the piles of snack items will not appear even. For size measurement, we often start with something called “unifix cubes” which are a uniform size, easily snap together to reach the desired length, and can then be counted to compare length. Then, we introduce **formal measurement tools** and begin discussing how to use them accurately. Rulers, tape measures, scales, thermometers, measuring spoons and cups, timers, and clocks are commonplace in our science centers, kitchen, woodworking area, and other places within the school.

As with all aspects of math, teachers and parents can help children to **notice opportunities for measurement**, such as the growth of plants in our spring gardens, how much later it stays light in the evening, the temperature of the bath water, the weight of recycling we collect every week, etc. By following the progression outlined above, we ensure that children **build a strong conceptual foundation** for understanding that all measures are invented and need an objective standard for comparison. Young children will have the most **positive experiences** with measurement if we follow their interests, such as using measurement with their own growth, collections, hobbies, etc. As situations arise, you might challenge the children to invent ways to measure which joke is funnier, baby happier, cat friendlier, etc. Doing so will prompt them to learn that there are still measures yet to be invented. To keep everyone focused on having a **growth mindset**, emphasize measures of personal growth and improvement rather than taking a competitive stance.

Summer is a wonderful time to use math skills to keep some records of your family fun, the number of books read or games played, the properties of objects collected, the distances traveled on foot or by car, etc. Consider documenting your math explorations and sharing them with us in the fall. Enjoy exploring math!