

CORE SKILL: THINK – MATH

Measurement



What You Need to Know

Measuring is any process that produces the numerical value for an attribute of an object. In other words, it is the number you come up with when determining the length, height, weight (or another attribute) of an object. Comparing involves determining the relationship between one attribute of two different objects. It allows you to determine if the object is longer, shorter, or the same length as something else. For example, “Is this stick longer, shorter, or the same length as this other stick?”

Things to Consider

Measurement and comparison have many applications in the real world for young children. While teaching, remember that attributes such as length and capacity (or volume) are clearer and more meaningful to children than less visible attributes, such as temperature or time. Children can more easily understand and retain what they have learned when learning is made concrete, visible, and relevant. Start teaching measurement and comparison by focusing children on concrete measurable attributes. For example, provide opportunities to compare the length of sticks by lining them up next to one another and using measurement words. Keep in mind that children need to learn the importance of lining up endpoints when comparing length. For example, children might use a cut piece of string and work to find objects the same length as, shorter than, or longer than the length of the string. They will need to make sure the end of the string is lined up with the end of the object to accurately compare. Once students can compare objects based on an attribute, provide opportunities for students to use manipulative units (like the edge of Unifix cubes) and conventional tools (such as scales or measuring cups) to begin measuring attributes.

Development of Measurement

Between 36 and 48 months, children may:	Between 48 and 60 months, children may:
With adult assistance, begin to understand that attributes can be compared, such as one child can be taller than another child.	With adult assistance, use measurable attributes to make comparisons, such as identifying objects as the same/different and more/less.
Identify that length is an attribute and identify that volume is an attribute; in other words, that objects have measurable characteristics.	Compare two objects and identify which is longer or if they are the same length and compare two containers to see which holds more by pouring sand/water from one container into another one.

Setting the Stage

Activities and materials that support the development of measurement and comparison:

- ◆ **Creatively using materials:** provide materials that children can use to measure and/or compare in the context of play and in more formal ways. For example, children can use snap cubes to measure objects around the learning environment (i.e., by finding objects that are shorter than four connected snap cubes). Or, encourage children to compare the weights and lengths of blocks as they build in the block area, or the weight of objects on the playground as they pick them up and hold one in each hand.
- ◆ **Use children’s own experiences and bodies:** incorporate measurement and comparisons into transitions and mealtimes. For example, line students up by height as they get ready to go outside or compare the lengths/weights of food. Alternatively, encourage children to use their own hands to compare the length of objects around the learning environment to find objects that are “just right” – equal or close to equal in length to one of their hands.
- ◆ **Play games:** teach games that involve measuring skills, such as those involving distances (e.g., hopscotch, tag, or a beanbag toss). Or, use a stopwatch/timer for races or activities and call attention to how you are measuring the time that passes.



Intentional Teaching Practices to Support Measurement Skills

OBSERVE	Observe Carefully observe children’s interest in and awareness of measurement and comparison concepts. To what extent do you observe them focusing on comparing and measuring attributes within the learning environment? Do you overhear children describing an object as ‘big’ or ‘heavy’ or comparing objects by noting that one is ‘bigger’ or ‘heavier’ than another?
FOCUS	Use Measurement Words Use the language of measurement and comparison during interactions with students across contexts (e.g., measure, weigh, heav(y)-ier/light-er, long-er/short-er, wide-er/narrow-er, far/near, now/later, fill, balance, equal). Provide additional support for students by offering visuals to prompt their understanding/use of measurement vocabulary. <ul style="list-style-type: none">◆ “Wow, you are carrying a large, heavy book to the reading corner. That book is <i>heavier</i> than all of the other books in our classroom!”◆ “How many spoonful of mud do you think this cup will hold? Let’s find out if it will hold <i>more</i> or <i>fewer</i> spoonful than this cup.”
SCAFFOLD I	Prompt Children to Compare Objects Provide support for children to encourage them to compare the attributes of objects on their own. <ul style="list-style-type: none">◆ “Which block is longer (<i>pointing to a ‘long’ visual</i>)? How can you figure out which one is the longest one?”◆ Set out a group of objects of varying lengths and encourage children to divide them into two piles by comparing each to a single object (such as a stick or a piece of yarn). They can work to make a pile of objects that are shorter than the yarn and a pile of objects that are longer than the yarn.◆ Using balance scales, encourage children to compare the weights of various objects – either from nature or from the learning environment – determining which are heavier than others. <p>For more support, provide choices of two or ask closed-ended questions to help children make comparisons. For example, rather than asking, “How heavy is the book?” ask, “Does this book feel heavy or light?” Additionally, consider comparing materials that have clear distinctions in their attributes to support children’s understanding. For example, when comparing sizes, use a penny and a chair.</p>
SCAFFOLD II	Prompt Children to Make Measurements Encourage children to make measurements independently. Earlier in the year, focus on using non-standard units of measurement. Later in the year, consider introducing standard units of measurement, such as inches, feet, pounds, minutes, or gallons. <ul style="list-style-type: none">◆ “How can we figure out how long this poster is by using paperclips to measure? Let’s line up our paperclips end-to-end without any holes in between them, and then count how many paperclips it takes to get across the whole poster. We learned that the poster is 12 paperclips long!”◆ Introduce rulers and challenge children to use the rulers to find objects in the learning environment that are exactly one foot long (be sure to have some one-foot objects out for them to find!).
KEEP IT GOING	Consider what you learned from observing children on Monday as well as their reaction to your Focus and Scaffolds. Find ways to build the activities from Setting the Stage into your regular routines.