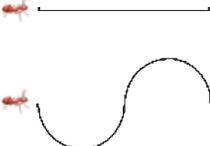
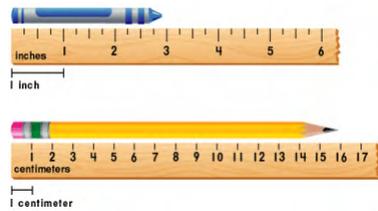


<p>Pre-Length Quantity Recognizer (PLQR)</p> <p>Does not identify length as attribute.</p> <p><i>"This is long. Everything straight is long. If it's not straight, it can't be long."</i></p> <p>Length Quantity Recognizer (LQR)</p> <ul style="list-style-type: none"> Identifies length/distance as attribute. May understand length as an absolute descriptor (e.g., all adults are tall), but not as a comparative (e.g., one person is taller than another). <p><i>"Both paths are the same length."</i></p>  <p style="text-align: right;">1</p>	<p>Length Comparer</p> <p>A. Length Direct Comparer (LDC)</p> <p>Physically aligns two objects to determine which is longer or if they are the same length. May use a ruler (as a stick rather than a measuring tool) to directly compare it and another object.</p>  <p>B. Indirect Length Comparer (ILC)</p> <p>Compares the length of two objects by representing them with a third object.</p> <p><i>Uses a piece of string to compare the lengths of two objects.</i></p> <p style="text-align: right;">2</p>	<p>End-to-End Length Measurer (EE)</p> <p>Lays units end to end. May not recognize the need for equal-length units. The ability to apply resulting measures to comparison situations develops later in this level.</p>  <p>Length Unit Relater and Repeater (LURR)</p> <ul style="list-style-type: none"> Iterates a single unit to measure. Recognizes that different units will result in different measures and that identical units should be used, at least intuitively and/or in some situations. Uses rulers with minimal guidance <p style="text-align: right;">3</p>
<p>Consistent Length Measurer (CLM)</p> <ul style="list-style-type: none"> Considers the length of a bent path as the sum of its parts (not the distance between the endpoints). Measures, knowing need for identical units, relationship between different units, partitions of unit, zero point on rulers, and accumulation of distance. Begins to estimate.  <p style="text-align: right;">4</p>	<p>Conceptual Ruler Measurer (CRM)</p> <ul style="list-style-type: none"> Has an "internal" measurement tool. Mentally moves along an object, segmenting it and counting the segments. Operates arithmetically on measures. Projects or translates given lengths to determine missing lengths. Estimates the length of an object that is not partitioned with accuracy and without any available image of the standard unit. Employs explicit strategies to estimate lengths, including developing benchmarks for units and composite units and mentally iterating those units. <p style="text-align: right;">5</p>	<p>Integrated Conceptual Path Measurer (ICPM)</p> <ul style="list-style-type: none"> Computes length of complex bent path and perimeter of a polygon. Can change one part of a figure and adjust other sides to compensate for length changes. In selection of units, children show well-developed ideas of precision and accuracy. <p>Abstract Length Measurer (ALM)</p> <ul style="list-style-type: none"> Organizes and synthesizes sets of objects based on perimeter or collections of complex bent paths. Constructs derived units with linear measures and make appropriate unit conversions, including units and divisions of units. Can explain that this subdivision process is <i>potentially unlimited</i>. Measures to the degree of precision allowed by a tool by estimating to a fraction of the smallest calibration mark provided on the instrument. <p style="text-align: right;">6</p>