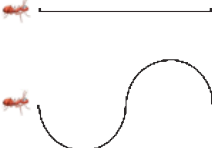


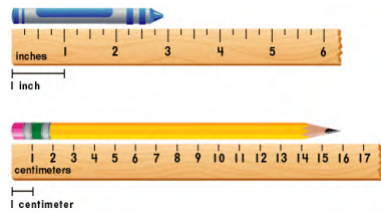


<p><b>Pre-Length Quantity Recognizer (PLQR)</b></p> <p>Does not identify length as attribute.</p> <p><i>"This is long. Everything straight is long. If it's not straight, it can't be long."</i></p> <p><b>Length Quantity Recognizer (LQR)</b></p> <ul style="list-style-type: none"> <li>Identifies length/distance as attribute.</li> <li>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).</li> </ul> <p><i>"Both paths are the same length."</i></p>  <p style="text-align: right;"><b>1</b></p>	<p><b>Length Comparer</b></p> <p><b>A. Length Direct Comparer (LDC)</b></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>B. Indirect Length Comparer (ILC)</b></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;"><b>2</b></p>	<p><b>End-to-End Length Measurer (EE)</b></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><b>Length Unit Relater and Repeater (LURR)</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Uses rulers with minimal guidance</li> </ul> <p style="text-align: right;"><b>3</b></p>
<p><b>Consistent Length Measurer (CLM)</b></p> <ul style="list-style-type: none"> <li>Considers the length of a bent path as the sum of its parts (not the distance between the endpoints).</li> <li>Measures, knowing need for identical units, relationship between different units, partitions of unit, zero point on rulers, and accumulation of distance.</li> <li>Begins to estimate.</li> </ul>  <p style="text-align: right;"><b>4</b></p>	<p><b>Conceptual Ruler Measurer (CRM)</b></p> <ul style="list-style-type: none"> <li>Has an "internal" measurement tool.</li> <li>Mentally moves along an object, segmenting it and counting the segments.</li> <li>Operates arithmetically on measures. Projects or translates given lengths to determine missing lengths.</li> <li>Estimates the length of an object that is not partitioned with accuracy and without any available image of the standard unit.</li> <li>Employs explicit strategies to estimate lengths, including developing benchmarks for units and composite units and mentally iterating those units.</li> </ul> <p style="text-align: right;"><b>5</b></p>	<p><b>Integrated Conceptual Path Measurer (ICPM)</b></p> <ul style="list-style-type: none"> <li>Computes length of complex bent path and perimeter of a polygon.</li> <li>Can change one part of a figure and adjust other sides to compensate for length changes.</li> <li>In selection of units, children show well-developed ideas of precision and accuracy.</li> </ul> <p><b>Abstract Length Measurer (ALM)</b></p> <ul style="list-style-type: none"> <li>Organizes and synthesizes sets of objects based on perimeter or collections of complex bent paths.</li> <li>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>.</li> <li>Measures to the degree of precision allowed by a tool by estimating to a fraction of the smallest calibration mark provided on the instrument.</li> </ul> <p style="text-align: right;"><b>6</b></p>