



## ELEMENTARY MATH PROJECT

### GRADE 1

## Measurement and Geometry

### Key Number Concept 1: Direct measurement with non-standard units

#### Sample Week at a Glance

Previous practice with a Number Line routine, such as the [Clothesline Math](#) routine, would allow students to make some useful connections between the Number and Measurement math strands. This prior knowledge is reflected in the sample lesson below.

<b>Monday</b>	<p><b>Topic:</b> Review of direct linear comparison of objects</p> <p><b>Before:</b> Gather students together on the carpet. Pull out two objects from the mystery bag. Ask students how they can tell which object is longer? The idea here is that students can compare the objects side by side to see which is longer. Emphasize the importance of lining them up using a baseline. Repeat this process with a few more objects, including two objects that are the same size. Discuss comparative language, such as: longer than, shorter than, the same length as.</p> <p><b>During:</b> Choose an item pulled from the bag (e.g., a sharpened pencil). Students are asked to look around the room in search of another object that is as close in length (height/width) to the object as possible. Students have a minute to find the object and bring it back to the carpet. Then ask volunteers to use direct comparison to see if the item they found is longer than, shorter than, or the same length as the teacher's item. Discuss the use of a baseline, estimating lengths, and using comparative language. Repeat with a few more objects from the mystery bag.</p> <p><b>After:</b> Ask students to compare their items with another student's items. Which items are longer or shorter? Are any the same length? How do they know? Have some students share their findings as a class.</p> <p>Alternatively, have students pick two items they compared and draw/trace them in their journals to show how you can compare length using a baseline.</p>
<b>Tuesday</b>	<p><b>Topic:</b> Explore measuring with uniform non-standard units</p> <p><b>Before:</b> Teacher prepares a number of bins of objects that can be used to measure items using non-standard units, such as linking cubes, colour square tiles, paper clips, counters, etc. The teacher shows students the picture of an item to determine the length of. A copy of <a href="#">this image</a> is on a sheet of paper for students to use. Teacher asks students: How can we describe how long the image is using the materials in the bins?</p>

	<p><b>During:</b> Students explore this question in pairs using the various materials. Partway through, the teacher gathers students at the carpet to discuss measuring strategies such as lining up multiple copies of one kind of material in a line or using repeated units of a unit. The teacher emphasizes key concepts described in the overview (baseline, no gaps/overlaps, measure in a straight line). Then students continue exploring using the materials and recording their results.</p> <p><b>After:</b> Students gather at the carpet to consolidate the key concepts and measuring strategies. This time the teacher focuses on how different size units produce different answers, whereas students using the same unit should get the same answer. The teacher can use <a href="#">this image</a> to help get the point across.</p>
<p><b>Wednesday</b></p>	<p><b>Topic:</b> Body Measures Lesson, part I (non-uniform non-standard units)</p> <p>Follow the three part lesson plan found <a href="#">here</a>. This lesson needs a double block of time to complete. If doing over two days (as is described here), it is suggested to complete the “before” section on the first day and the “during” and “after” on day two. Some students may need additional time to complete their personal measuring tapes. Early finishers can use their measuring tapes to measure all sorts of things inside and outside of the classroom.</p>
<p><b>Thursday</b></p>	<p><b>Topic:</b> Body Measures Lesson, part II (making a personal measuring tape)</p> <p>Follow the three part lesson plan found <a href="#">here</a>. This lesson needs a double block of time to complete. If doing over two days (as is described here), it is suggested to complete the “before” section on the first day and the “during” and “after” on day two. Some students may need additional time to complete their personal measuring tapes. Early finishers can use their measuring tapes to measure all sorts of things inside and outside of the classroom.</p>
<p><b>Friday</b></p>	<p><b>Topic:</b> Practice with measurement</p> <p><b>Before:</b> Number Line routine. Draw a number line on the board using a metre stick marking 0 (at the 0 cm mark) and 20 (at the 100 cm mark). Then ask students to estimate where they would place the numbers 9, 6, and 17. Alternatively, you can use 0 to 10 and the number 7 if this is too challenging. Discuss strategies, such as using benchmarks (5, 10, 15).</p> <p>Connect to the previous lessons by showing how a measuring tape or ruler is a number line that can be used to measure objects. You can place items on the board with the baseline of 0 to measure them to make this point clear.</p> <p><b>During:</b> Math Workshop. Some ideas include...</p> <ul style="list-style-type: none"> <li>• Meet with the teacher to formatively assess key measurement concepts: baseline, gaps/overlaps, measuring in a straight line, uniform vs non-uniform non-standard units, standard vs non-standard units (if students are curious). Have students measure various items while you observe, support, and provide individualized feedback as necessary.</li> <li>• Online measurement games such as <a href="#">this one</a> (K) or <a href="#">this one</a> (gr. 1) or a Mathletics assignment.</li> <li>• Measuring objects using uniform non-standard units. Provide baskets of items for units as well as objects to measure. This encourages students to line up repeated units.</li> </ul>

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|  | <ul style="list-style-type: none"><li>• Measuring objects using uniform non-standard units. Provide objects to measure and single units to iterate. Alternatively, you can combine this station with the previous one and have students compare their answers using repeated units vs iterating.</li><li>• Measuring objects using non-uniform non-standard units. Provide objects to measure and encourage students to use body measures or their personal measuring tapes from the Body Measures activity.</li></ul> |
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Alternatively, some students may need time to finish their personal measuring tapes from the previous lesson.

**After:** Students and teachers meet to debrief the stations with a particular focus on any areas that students found challenging or interesting. For example, how did measuring an item with multiple copies of the same unit compare with iterating one of these units? How did using small units compare to using larger units? How can we be very precise with our measurements?

The following week could begin with outdoor opportunities for students to use their personal measuring tapes and some assessment of measurement concepts. Students can then explore tiling an area... How does the size of the square affect the measure of the area? How can we compare the area of two different rectangles? Why squares and not circles? (Think no gaps/overlaps.)

### **Suggestions for Assessment**

What to look for:

- Uses a baseline to measure, and measures in a straight line with no gaps or overlaps
- Can measure using multiple copies of the same unit or iterate a single copy of a unit
- Personal measuring tape has consistent increments and is used effectively
- Understands the difference between uniform and non-uniform units