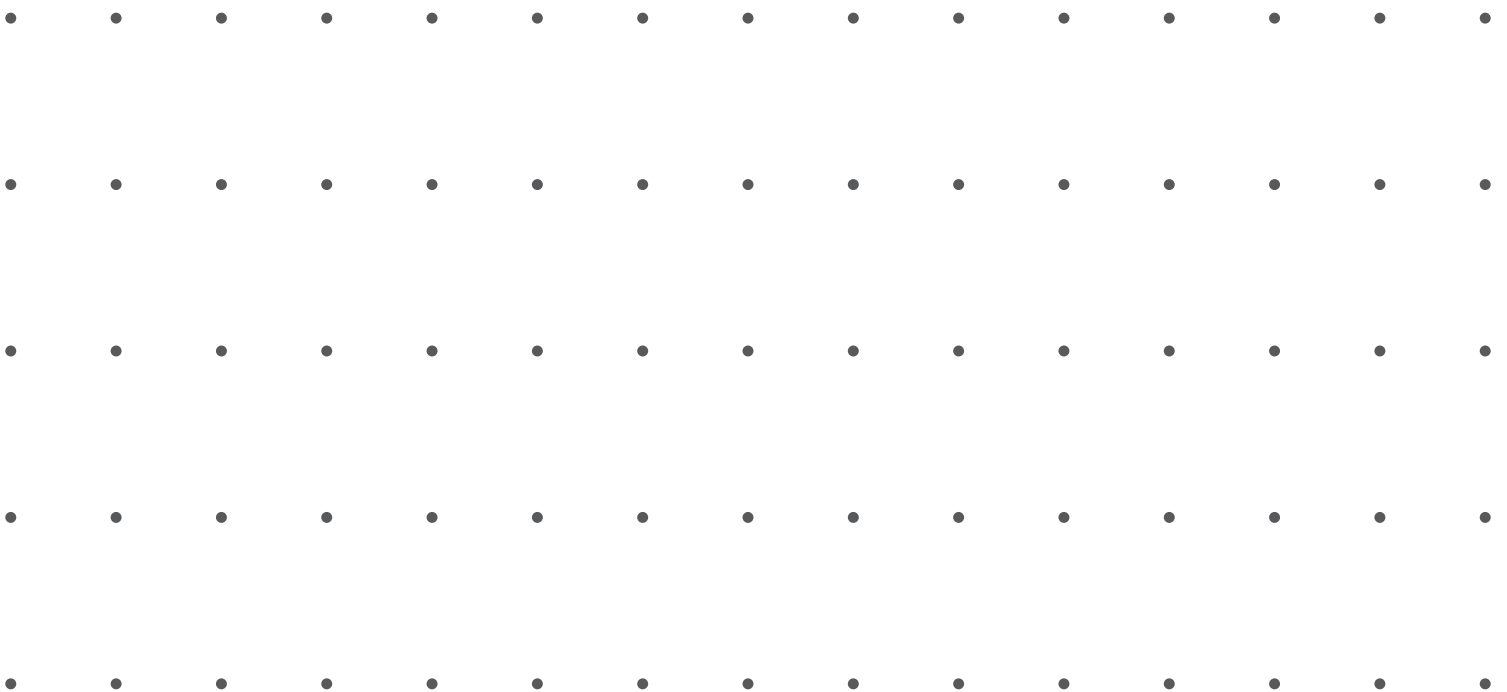# Folding Lines

Draw a red line.

Now draw a blue line that would be just a little longer than the red one if you folded it in half

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What's the point of this task?

This task provides an opportunity for students to compare lengths directly. But, more importantly, it builds visualization skills by having students imagine what half or twice as long as something would be. The task starts students on the road to proportional thinking by relating the concepts of half and twice and by helping students to see that the problem is not about absolute lengths, but relative lengths. Two students could be correct with very different lines because it is the relationship between the two lines that matters.

Rather than asking that the folded line be exactly the same as the original, the phrase "a little longer" is used so that students will not be hung up on being perfect, which is not really what the task is about.

Questions to facilitate the learning

• Could you just look at your blue line and know it is just a LITTLE longer than the red one if you folded it in half? How? What would you have to do to check?
• How does your red line compare to your blue line in length?
• Would a line that is exactly twice as long as the red line be longer or shorter than your blue line? Why?
• Would everyone who does this task end up with the same length line? Why or why not?

Curriculum connections

This activity relates to directly comparing length measurements (WNCP Kindergarten, Shape and Space. British Columbia, Kindergarten, Shape and Space: C3; Grade 1, Shape and Space: C1. Alberta, Kindergarten, Shape and Space: SS1; Grade 1, Shape and Space: SS1. Manitoba, Kindergarten, Shape and Space: K.SS.1; Grade 1, Shape and Space: 1.SS.1. Saskatchewan, Kindergarten, Shape and Space: SSK.1; Grade 1, Shape and Space: SS1.1. Québec, Cycle 1, Measurement: A.1.2. Ontario, Kindergarten, Measurement: M2.1. CCSS, Kindergarten, Measurement & Data: K.MD.A.2). It also touches on the concept of one half, which is formally introduced in Grade 1 in some jurisdictions but is informally understood by many young children. Processes include visualization (WNCP) and reasoning (WNCP and Ontario). CCSS Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Scaffolding the learning

• Will the blue line be longer or shorter than the red line? How do you know?
• Do you think it will be a lot longer?
• How could you use the lines in the background to help you?

Extending the learning

Students might consider making the blue line a little longer if it's folded twice. They would then see it is actually more than four times as long as the red line. Alternatively, they could start with the long line and draw the short line to meet the original conditions.

Rubric

Level 1	Level 2	Level 3	Level 4
The student draws a blue line, but the length is very inaccurate.	The student's blue line is somewhat longer or shorter than it should be, but not by much.	The student's blue line is a reasonable length and he/she can show why. The student recognizes that the blue line is more than twice the length of the red OR that the red line is just a bit less than half the length of the blue, but does not necessarily recognize both.	The student's blue line is a reasonable length and he/she can show why. The student recognizes that the blue line is more than twice the length of the red AND that the red line is just a bit less than half the blue. The student can explain why different people can have different length blue lines based on the lengths of their red lines.