

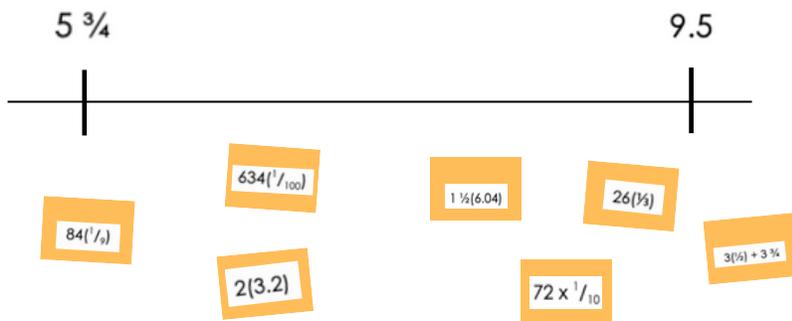
thought exercise

NUMBER LINE

The Number Line Thought Exercise helps learners build an understanding of number relationships—magnitude, difference/range, median, ordinality, substitution principle, and proportionality—through critical analysis of number positioning on a number line. This Thought Exercise occurs in a whole group, and an open number line is drawn on a large whiteboard. Post-it notes have expressions written on them and are stuck below the open number line. Ultimately, one learner at a time will approach the whiteboards, select a post-it, simplify the expression, and place it on the number line appropriately. The learner will justify choices by explaining to peers and the rest of the class will agree, disagree, and engage in discussion.

Begin the exercise by having learners consider that which would make plotting the numbers an easier task. Ask: “What position on the number line or number that is not included in the set below the number line would make plotting the rest of the number an easier task?” The goal is to press learners to think about the median: the number that is the midpoint of the two extremes. To determine the median, lead learners in a discussion that includes understanding and use of the range: the distance, in whole units, from the lower extreme to the middle extreme or vice versa. In the example below the range is 3.75. Typically we indicate the range by drawing an arc from the lower to upper extreme and notating the range above the arc.

After determining the range, lead learners (until they independently do this) to find and mark the median, using the range. Learners should continue using the idea of median between extremes to aid them in reasonably plotting all the specified values given on the post-its. Perhaps quarters could come next, dividing the range or distance between $5\frac{3}{4}$ and 7.625 into two halves, as well as the distance between 7.625 and 9.5. Then, learners can begin plotting the specified values, shown in the below example on orange post-its. Ask for volunteers to come forward to share their thinking concerning a value they have chosen to plot at a certain point on the number line.



Given:

Lower Extreme	$5\frac{3}{4}$
Higher Extreme	9.5

Values to be plotted:

$84(\frac{1}{9})$	$2(3.2)$
$72 \times \frac{1}{10}$	$634(\frac{1}{100})$
$1\frac{1}{2}(6.04)$	$26(\frac{1}{3})$
$3(\frac{1}{6}) + 3\frac{3}{4}$	

Context of Instructional Design

This Thought Exercise was created for Red Band, a group of 2nd and 3rd graders in their first year of studying with us. The particular prompts highlighted here were strategically designed to push learners to consider counts of various terms and how the expressions compare in value. As Red Band worked through this Thought Exercise, they began to look for efficient ways to compare the expressions without fully evaluating them.

