

Curriculum Units by Fellows of the National Initiative 2016 Volume V: The Number Line in the Common Core

## **Decimal Expansion: An Address System for All Numbers**

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The goal of this unit is for middle school students to acknowledge the number line as a measuring device rather than a counting tool. As the number line shows the relationship of number placements in different base-ten scales, students can demonstrate that every rational number has its place on the number lines by doing decimal expansions. During the course of studying decimal expansions, students will see that the set of real numbers with terminating or repeating decimal expansions precisely finds their address on the number line. Decimals should not be treated as an isolated mathematical concept, but identified as a precise system to locate a number on the number line with its unique address. The metric system will be implemented as an extension of base-ten scales and students will be able to use the number lines with millimeter, centimeter, decimeter, and meter markings to measure line segments to the nearest tenth of a centimeter, a tenth of a decimeter, and a tenth of a meter. Presenting the metric system in scientific notations and relating it to the number line in a multiplication of tens; 1000, 100, 10, and 1 or 1, 0.1, 0.01, and 0.001 will be used as a form of formative assessment of the unit study.

(Developed for General Math, grade 8; recommended for General Math, Pre-Algebra, and Algebra, grades 7-9)

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