



Curriculum Units by Fellows of the National Initiative

2023 Volume III: Transitions in the Conception of Number: From Whole Numbers to Rational Numbers to Algebra

Numerical Development: from whole numbers to fractions

Guide for Curriculum Unit 23.03.05, published September 2023

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While teaching my Geometry, Pre-Calculus and AP Calculus students, I have realized that using **fraction notation** as well as **comparing, adding, subtracting, and dividing fractions** is usually a big problem for them. As a result, they struggle to identify parallel and perpendicular lines and slopes in the equations of linear functions; they have difficulties with topics such as similarity, dilation, transformation of geometric figures, and other mathematical concepts. Later, in upper-level Math they struggle with trigonometry, derivatives (aka slopes), definite integrals and their applications to name just a few. And this is just the tip of the iceberg. The lack of their knowledge of fractions leads to their failure in other Math- related fields, such as Physics, Biology and Chemistry. During their high school career, many students will have to take a standardized test like the SAT and/or an AP exam. Half of the Math portion of these tests is non-calculator. Our job is to get them ready; soon-to-become young adults need fractions in their local grocery store calculating seasonal discounts! This curricular unit will help teachers build students' **competence in computation of expression with fractions, solving equations and word problems that require students to compare, add, subtract, multiply and divide fractions.**

Recommended for Algebra I, Algebra II, Geometry, PreCalculus and AP Calculus students.

(Developed for Math Analysis, grade 11; AP Calculus, grade 12; and Geometry, grade 9; recommended for Mathematics, grades 3-7; Algebra I, grades 8-9; and Geometry, grades 8-9)

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