Curriculum Units by Fellows of the National Initiative
2014 Volume V: Place Value, Fractions, and Algebra: Improving Content Learning through the Practice Standards

---

# Using Math Practice Standards to Understand Functions and Their Inverses

Guide for Curriculum Unit 14.05.08, published September 2014
by Nancy Rudolph

This curriculum unit provides meaningful instruction in the CCSS-M Content Domain of High School Functions while implementing the Standards for Mathematical Practice. I am writing it for my precalculus students, but much of it will apply to any algebra course. This unit was organized by first creating a "Lesson Tree," which our seminar leader, Roger Howe, describes as a progression of lessons "whose coherence and connectedness promote the Practice Standards." The lessons are grouped into three major sections: "What Exactly *Is* a Function?", "Making New Functions From Old", and "All About Inverse Functions." My goal is to expand students' definition of a function, emphasizing domain and range. Students will learn function operations, including composition, an operation in which it is critical to understand domain and range to be able to recognize when composition is undefined for all values of the independent variable. Students will study function transformations as composition. Finally, students will learn the requirements of, and the process for finding inverses of functions. Again, students must be aware of domains and ranges to understand when a function is invertible and, if it is not, how to restrict its domain so that it is.

(Developed for Mathematics - Pre-Calculus and Mathematics - Trigonometry [transition course], grades 11-12; recommended for Pre-Calculus, 10-12, and Algebra I [parts of unit] and Algebra II , grades 9-12)

---