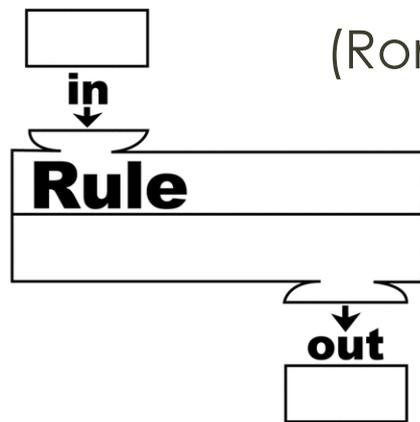


“Functions form the single most important idea in all mathematics, in terms of understanding the subject as well as for using it for exploring other topics in mathematics.”



(Romberg, Carpenter, & Fennema, 1993, p. i)

“Functions are one of the most important mathematical tools for helping students make sense of the world around them as well as preparing them for further study in mathematics.”



(NCTM Yearbook, 2001)

Functions have been called a “power tool” for exploring change in our world.



# About 85,000 students fail Calculus I each year...

College mathematics teachers are nearly unanimous in their view that most students are blocked from ever understanding calculus by the inadequacies of their understanding of functions.

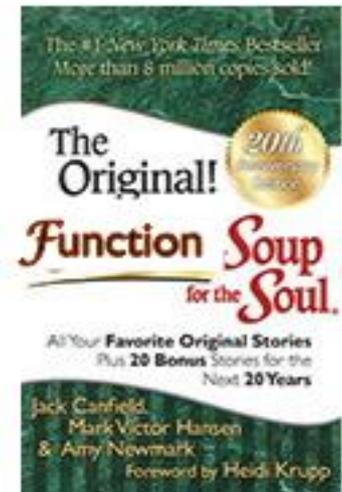
At the same time there is a growing consensus in that mathematics education community that students can only come to understand the concept of function slowly over several years.

(G. S. Monk, 1989)

# Some Background:

## 20th Century:

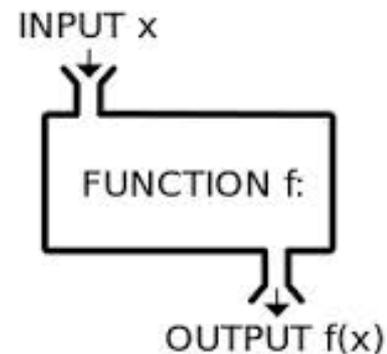
- German mathematician Klein (1904) referred to "function" as the "soul" of mathematics and recommended an elementary treatment of it in all high schools
- This influenced math education in the United States



# Some Background:

(1921):

National Committee on Math Requirements of the MAA recommended that functional thinking be the unifying central principle of secondary mathematics.

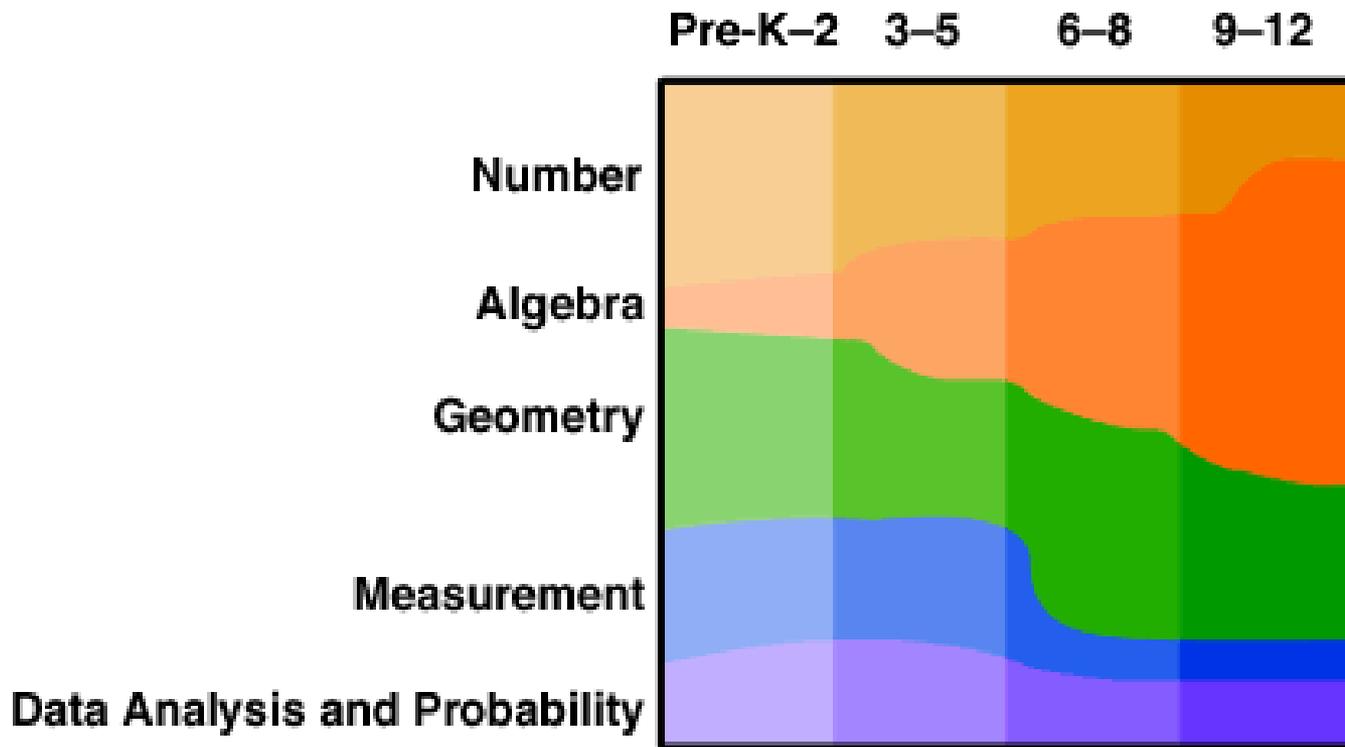


# Some Background:

- NCTM (1989) called functions a “unifying idea” – a major mathematical theme which is relevant in several different strands
  - Helps students connect different mathematical ideas and procedures
  - Many Algebra/Geometry connections

# Suggested content emphases: (NCTM, 2000)

*Principals and Standards for School Mathematics, p. 30*



# Shift in emphasis:

"The Standards" texts (NCTM 1989, 2000) placed more emphasis on graphing and interpreting real world phenomena.



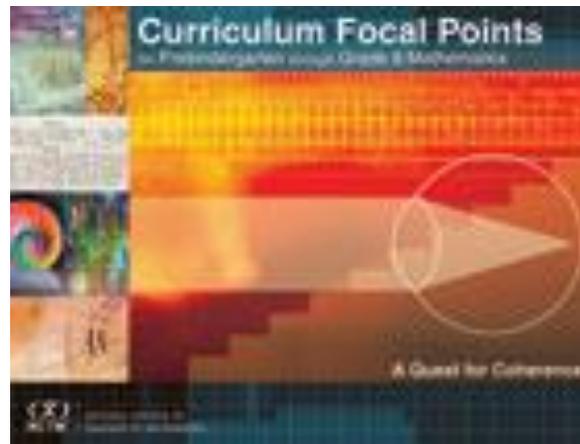
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HIGHER STANDARDS for OUR STUDENTS  
...HIGHER STANDARDS for OURSELVES

# NCTM Curriculum Focal Points

In this document (2006), NCTM presented priorities for the mile-wide, inch-deep curricula for grades K-8 (major instructional goals).

A major emphasis for Gr 8: Analyzing and representing linear functions



# ENTER Common Core! (2010)

The separation of algebra and functions in the Standards is...intended to specify the difference...between expressions and equations on the one hand and functions on the other. Students often enter college-level mathematics courses apparently conflating all three of these.

(Progressions for Common Core, High School,  
Algebra (2013), p. 3)