

# Math Goals and Overcoming the LIST

- The Terror of THE LIST. It can seem quite overwhelming. But our task at hand is to identify only the skills that need to be fully mastered. Let's get the burden of The LIST off our backs by breaking it down. I break it down into five sub-lists:
  - The essential math skills that are truly needed for the students' future studies. This is a short, manageable list, which we will talk about later.
  - Additional skills-oriented topics that we should cover, but mastery in the future isn't necessary. (E.g., long division, writing deductive proofs, or graphing circles)
  - Amazing mathematical experiences that I want my students to have, but most students never see.
  - Uninteresting math topics that often appear in textbooks, but I chose not to bore my students with.
  - My sad list of topics I wish I had time for. I accept that I can't teach everything I'd like to.
- This is an example of how when we think through something thoroughly, we can become aware of our unconscious assumptions, come to clarity about what needs to be done, become less fearful, and feel less overwhelmed.
- The major developmental themes for math.
  - Grades 1-4: Developing a sense of number & Arithmetic Facts
  - Grades 5-6: Consolidating procedural skills
  - Grades 7-9: Developing abstract thinking
  - Grades 10-12: Developing higher-level thinking (critical, analytical, synthetic, etc.)
- What do Students really Need to be Prepared for their Future Math Studies?
  1. Enthusiasm for learning math.
  2. Mathematical thinking
  3. Solid basic skills. This is a relatively short list (see below).
- The Necessary Basic Skills.

These are the skills needed to be mastered by the end of...

  - Fourth Grade: Arithmetic facts learned "by heart"; Sense of Number.
  - Sixth Grade: All procedural skills, including: Fractions, Decimals, Measurement, Estimation. Vertical Arithmetic (long division, long multiplication, etc.)
  - Eighth Grade: Percents, Ratios, Basic algebra (not too much!), Area and Volume, Dimensional analysis (i.e., unit conversions).
  - Twelfth Grade: Algebra fundamentals, Cartesian geometry, Trig, Logs, Functions.
- But let's not forget our "Biggest Goal": Avoiding Math Trauma.
  - Being "math healthy" includes:
    - Being open to problem solving, puzzles, and trying to figure it out.
    - Determination to improve even if math is hard for you.
    - A curiosity to learn new things.
    - A desire to understand "why".
    - A recognition that mistakes are a necessary part of learning math,
    - Being OK with confusion.