

Tips for Math Success – An Engineering Prof & School Parent's Perspective

CyMath <https://cymath.iastate.edu/>

Dr. Namrata Vaswani, Professor of Electrical & Computer Engineering & Director of CyMath K-12 Math Tutoring+Support Program & a school parent (everything on these slides is Namrata's personal perspective, not ISU's)

Why is Early Math (grades 3-5, 6-8) Critical?

Math is cumulative.

Addition and subtraction lead into multiplication and division. All of these lead into fractions and decimals and doing the basic operations with them. All of this is critical for understanding pre-algebra (ratios etc) and algebra which is the basis of high school math and physics and a lot of college STEM and Engineering course-work. Algebra is also critical to understand coding for Engineering apps.

Starting in Grade 6, students who have scored highly on standardized tests get the opportunity to take accelerated math classes. These allow students to get farther along, quicker, leading to taking more advanced math courses in high school.

How to Learn and Practice Math



Math requires dedicated practice. CyMath suggests 5 days a week 15-30mins each (grades 3-5), and 30-50 mins for grades 6-8

- Free Options:
 - Khan Academy - has videos & practice problems. First starting point
 - Beestar.org - 2 free worksheets/week, no videos. Good for some challenge
 - Printed worksheets: BeeStar, K5Learning, MathWorksheets.com
- Paid Options:
 - Beast Academy - good for challenging students, may need a little bit of parent/tutor help to stay on it.
 - ALEKS - CyMath uses; good to pick up missed skills

- It is okay to know one way to do arithmetic (even if it is not the “new” way)! You can teach it the way you learned it.
 - To learn later math – it doesn’t matter how you learned to multiply as long as you know how to.
 - Tests – computer tests, also don’t care about

Standardized Testing

Standardized Testing – In Ames this means iReady or MAP and ISASP

- **Okay to email to ask teacher and principal for dates**
 - Everyone means well – for some confusing reason teachers are encouraged not to bother parents
- Happens 4 times per year: iReady (3x), ISASP (1x) – September, January, April (ISASP), May
- **Adaptive Testing – iReady n MAP tests are adaptive**
 - Harder problems are worth more points than easy ones
 - If they do these easy ones wrong, they do not get harder ones
 - score gets capped at low value
- How are the scores used – divide kids into compacted, regular, alternate math in middle school and later.
- Compacted math implies you can do Algebra 1 by 8th grade – good idea for getting enough math classes for STEM college

How to Use Khan Academy

How to get started with Khan Academy.

- Sign up as Parent (can use a Google account)
- Add your student(s)
- If you don't know what your student needs:
 - Have them start one or two grade levels below (depending on level of struggles)
 - There are also "Getting Ready for (Grade)" classes
 - Take the Course Challenge (scroll to bottom of grade level page).
 - Like a final exam and will show what skills are mastered and which need work.
 - Take it from there.
 - If you do well (at least 85% or higher), go to next grade.
 - If not, review topics and take quizzes/tests on them for that grade level
 - You will be able to see which skills are mastered or not
- Important to know all past math to learn current grade math well!
- Parent tip – make sure kids aren't goofing off on the computer!

Using AI to Reteach Math

Using ChatGPT (or MetaAI) to teach you math in your own language is a great way to learn! Here's how you can make the most of it:

- **Specify Your Language:** When you ask for help, just let it know which language you'd like to use.
 - Just say: "Can you explain in Spanish?" and it will do so!
- **Set the Math Level:** Let the AI know what kind of math you are learning (e.g. arithmetic, pre-algebra, etc) and it will tailor the explanations to that level.
 - You can also ask it to simplify the explanation if you do not understand the first time.
- **Ask Questions and Practice:** You can ask specific math problems or concepts and it will provide step-by-step solutions.
- **Request Examples:** If you are learning a new topic, you can ask it to give examples of solving that type of problem.
 - Example: "Can you show me an example of solving an inequality in French?"
- **Interactive Learning:** You can ask the AI to quiz you, give you practice problems, or simplify instructions for more clarity!

More on Khan Academy (but not essential)

The Extra Bits:

- Signing up as a Parent still lets you make classes and act as a teacher.
 - You can create a class if you want to give assignments
 - Student will have to have option to add coaches
 - Student will then have to use class code to join
 - Teacher accounts are geared towards monitoring multiple students
 - Gives less control over the student's account, but is a little more streamlined
- Having the Khan Academy account will let you monitor:
 - How much time they are working
 - Topics they are covering.

All information:

<https://cymath.iastate.edu/math-for-all/>

Sign-up to learn or to tutor or to help in a different way

<https://cymath.iastate.edu/>

Email namrata@iastate.edu for editable copy of these slides