

CyMath-ISU K-12 Math Tutoring and Support -- Report for 2024-25

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Lead Coordinators: Hae tha lay Paw (Fall 2024, Elem Ed student); Kyle Lewin (Spring 2025, staff)

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

Short summary: https://www.ece.iastate.edu/~namrata/Cymath_brief.pdf

Submitted opinion article: https://www.ece.iastate.edu/~namrata/cacm_final_2.pdf

CyMath is ISU College of Engineering's math tutoring and support program that provides school-year long and summer-time (at least) weekly small-group support to K-12 students starting in grade 3. Its mission is to improve the likelihood of STEM college and workforce success of all students, regardless of background. CyMath tutors are Engineering and Math/Statistics graduate student/postdoc/faculty and some undergrad volunteers; supported by 1-3 paid undergraduate Math or Education program assistants for each session. A math learning and practice app (ALEKS) is used to aid tutoring and encourage at-home practice. This reduces the need for tutoring prep, but tutors are welcomed and encouraged to use ALEKS problems as starting points to build off of. CyMath does not insist on any one particular tutoring style. Even just sitting with a student as they work on their own can be hugely beneficial.

Due to the cumulative nature of mathematics education, if there is knowledge missing in students' learning in early grades, it becomes more difficult to address as the child advances in the education system. CyMath thus attempts to start helping students in grades 3-5. It also directly enrolls students in middle or high school, since that is still much earlier than college. CyMath was founded in Fall 2020 to help prevent or reduce the impact of COVID learning losses. The program director is an Electrical Engineering and thus the program design is informed by the skills needed for future STEM/Engineering success.

Enrollment and Sessions: CyMath currently supports 70-75 students in grades 3-10, tutored at least weekly in hybrid-mode. In the past year, we supported about 20 students in Fall 2024, about 40 in Spring 2025, and went up to 60-65 students by the end of Summer 2025. In 2023-24, we started with 7 students and ended with 15-20. Since it is a free program, some signup but never attend or join occasionally or stop coming. About 50-55 come regularly.

- *Fall 2024:* CyMath ran twice a week on Tuesdays and Thursdays after-school for Sawyer students (grades 3-5), with second session being on Zoom for many students
- *Spring 2025:* We added ISU/Zoom sessions on Saturday mornings in March 2025 to support middle schoolers.
- *Summer 2025:* Hybrid mode Saturday morning sessions (about 8 Saturdays in-person in Coover Hall and all Saturdays on Zoom) ran all summer. We enrolled high school students as well.
- *Fall 2025:* We have added an after-school session at Ames Middle School also. Now CyMath runs Mondays at AMS, Tues-Thurs at Sawyer, Wednesdays on Zoom for middle/high students, and Saturdays in hybrid-mode (one ISU session each month) for all grades 3-12 students.

- All sessions provide an hour of math tutoring with one tutor helping 1-3 students.
- We also now have a few non-Ames students who come to ISU and Zoom sessions.

STEM Activities, Parent Workshops, Food

- **STEM Activities to serve as Motivation for Math:** STEM activities were added after many of the in-person ISU sessions and were taken to Sawyer at least once a semester also.
- **Pizza** was provided for tutors and students at most in-person ISU sessions. Pizza parties were also held once a semester at Sawyer.
- **Short parent workshops** were held to discuss the importance of early math skills for future success and how to help students practice more. Slides: <https://cymath.iastate.edu/math-for-all/>

Impact on Tutors: Based on an initial set of surveys, the tutors also benefit significantly in terms of improved communication and teaching skills and finding community and extra mentors. In our first survey of all tutors conducted in Summer 2025, we had 18 total respondents (12 graduate students or faculty and 6 undergraduates). Of these, 94% said tutoring helped improve their teaching skills, 83% said it improved their communication skills, and 44% said it also helped them find community. In comments, many expressed greater confidence and adaptability in working with children, developing empathy, and learning to explain concepts in a simple manner.

Student Quantitative Progress: Of the 15 3rd-6th graders who have spent at least a year at CyMath, all but one student showed growth in math scores. Over a third of these – 6 out of 15 -- have shown very large growth in math skills; they have moved up in math achievement percentile (in standardized tests administered by the schools) by 20 or more points. The tests were iReady in 2024-25 and MAP in 2023-24.

- Student AA (started in Fall'23 in grade 3) went up from 46-th to 85-th percentile in a year and has remained at that level or higher;
- Student NN (started in Fall'23 in grade 3) went from 20-th to 55-th percentile in a year and has remained at that level or higher;
- Student GG (started in Fall'24 in grade 5) went from 34-th to 80-th percentile in a year;
- Student MM (started in Fall'24 in grade 3) went from 78-th to 98-th percentile in a year;
- Student TT (started in March'24 in grade 4) went from 34-th to 55-th percentile in a year;
- Student NN2 (started in March'24 in grade 5) went from 7-th to 28-th percentile in a year.
- Few others have moved up about 10 percentile points but since the adaptive testing scores and percentiles are very noisy, we only mention large changes.

Tutoring Team: Also see <https://cymath.iastate.edu/our-history/>

- o **Dr. Namrata Vaswani** – Director; filled in for tutoring where needed; checking on various students' math occasionally and advising tutors/parents
- o **Fall Volunteers:** Dr. Mohamed Selim, Dr. Molly Kozminksky, Dr. Shuang Li, Dr. Hugo Villegas, Ali Jahanbani Ardakani, Grace Buhl, Chit Ying Chan, Vrinda Girimaji, Prajwal Koirala, Jaibin Lin, Sarah McCarty, Chevonne McInnis, Ruoyu Meng, Abhaya Neupane, David Ntako, Alexander Parker, Seonghun Son, Verma Urvashi, David Walker, Jorge Yass.
- o **Spring and Summer Volunteers:** Dr. Mohamed Selim, Dr. Molly Kozminksky, Dr. Shuang Li, Dr. Hugo Villegas, Ali Jahanbani Ardakani, Vrinda Girimaji, Jaibin

Lin, Sarah McCarty, Ruoyu Meng, Jorge Yass, Ayoola Adebowale, Mobina Amrollahi, Amreen Chhina, Sarah Kilgard, Xiao Liang, Victoria Lenius, Gideon Owusu, Ria Patel, Vaishnavy Srinivasan Raghunath, Steffina Samuel, Jonathan Tjioe, Dr. Aditya Ramamoorthy, Dr. Bai Cui, Dr. Tathagata Basak

- Most are professors or grad students in ECpE, Math, Stat, Comp Sci
- Many have taken an EE class with Dr Vaswani (EE 623 or EE 425).
- Victoria Lenius, Steffina Samuel were undergrad volunteers.
- Ria Patel and Amreen Chhina came through WiSE
- **Lead Coordinators:**
 - Hae Tha Lay Paw, Elementary Ed student – 2024 all year
 - Jolien Hidalgo-Murra – Elementary Ed student – Spring 2025
 - Kyle Lewin – January 2024 -- present
- Other paid Undergrads:
 - Grace Buhl and Emma Buhl
- CyMath Alums
 - Kyle Lewin – Math Teacher at Ankeny Middle School
 - Hae tha lay Paw – Elementary Teacher in Marshalltown
 - Sarah McCarty – Math Teacher at Gilbert High School
 - Many volunteers working / teaching in STEM companies / universities

Brief History of CyMath

- **CyMath 1.0: School years 2020-2022:** In 2020-2022, CyMath started and ran in virtual mode for students from one Des Moines, Iowa elementary school, with one tutor working with 2-4 students. In 2020-21, we had 14 third grade students and 5 tutors, in 2021-22, we had about 35 third and fourth grade students and 10 tutors. Once a week small group learning worked well, even in online mode, for students who attended regularly. However, at the end of the second school year, students had lost the ability to focus virtually.
- **CyMath 2.0: Spring 2023:** We tried to reach students through Science Bound connections while still proposing to start tutoring in online mode with some in-person trips. This failed (started for 3-4 students of Des Moines Virtual Campus but they missed many weeks).
- **CyMath 3.0: School year 2023-24 - In-Person Then Hybrid:** ran for a full year every Tuesday and Wednesday 2:45-4pm from September to May except school breaks at Sawyer Elementary in-person. Experimenting with sessions at ISU and Zoom during May-July. Since Summer 2024, we run in hybrid-mode. We are now at Sawyer, AMS, ISU and Zoom. Details provided above.
- **Key people that helped at various points: 2020: Prof. Christa Jackson, 2023: Ms. Erin Miller, Ms. Nicole Coronado (Sawyer principal), Ms. Anita Rollins, Ms. Renee Gibert (Purdue University, former coordinator of Algebra by 7th Grade). Ms Hae tha lay Paw (the first student worker of CyMath who played a huge role in making it systematic; now Ms Paw is an elementary school teacher in Marhshalltown).**

CyMath - Activities in 2026

- **More undergraduate students involved – REU, hourly, volunteer tutors**
- **New grant from Iowa Energy Center for High Schooler Teach and Learn**

TRIO Program Students: **New this year**, CyMath expanded to support the TRIO program students. About 15-20 middle and high school students from Fort Dodge, Perry, or Marshalltown are bused by TRIO To ISU once a month for the ISU CyMath sessions. Some also join our weekly Zoom sessions. TRIO refers to the three original federal programs: Student Support Services, Talent Search, and Upward Bound, and all of this is funded under the Higher Education Act.

CyMath + ISUEO partnership for Collins, IA: **New this year** is CyMath STEM in Collins, IA. This started on February 2nd and runs each Monday until the end of April with plans to continue later. It provides math tutoring for Collins-Maxwell students in grades 4-12. It uses Khan Academy to tutor students, followed by a STEM activity. The session is held on Monday mornings because Collins schools stay closed on Mondays.

CyMath Workshop on “Math for STEM Success: Grade to Grad School”: **CyMath held its first workshop** on January 30 and 31. Details - <https://cymath.iastate.edu/workshop/> There were many sessions, including “Why Learn Math?” and panels. It included speakers from the student team leads, volunteer graduate tutors and Dr Vaswani.

Zoom and ISU CyMath sessions: The Zoom sessions happen on Wednesdays (6-7:30 pm) and Saturdays (10 am-12 pm). Wednesdays are open to middle and high schoolers while Saturday are for any student in grades 3-12. These are also run by 2 program assistants and the rest are tutors (all tutors are volunteers). Many ECpE faculty also tutor by Zoom on Saturdays. We meet monthly on ISU campus also and this meeting often also includes a STEM activity.

Sawyer CyMath sessions: Run by Chole McAleer (Math undergrad) assisted by Sienna S (Elem Ed undergrad) and Emma B (Mechanical E undergrad), held every Tuesday and Thursday from 2:45-4:30. Most other tutors are graduate student volunteers. Students come after school for an hour of tutoring in math. They can either use their Chromebooks to access Khan Academy or ALEKS, or worksheets and workbooks are provided. Each student has personalized learning for their grade. Some students in more advanced math receive harder and on-par work.

AMS CyMath sessions: Run by Zachary Barton Robyn (math + education undergrad) and assisted by Victoria (engineering + math undergrad), he leads each session at the Ames Middle School. Most other tutors are graduate student volunteers. They are held from 4-5 pm.