

Solving for Success: How Wisconsin can help improve math instruction

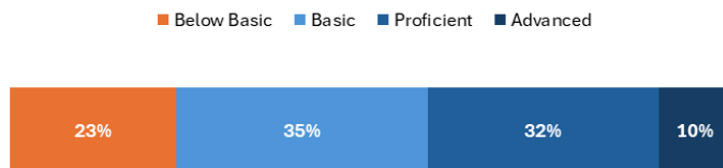
Math matters. Higher math scores for elementary age students tend to translate to higher earnings as adults.¹ In fact, math scores predict future earnings better than reading scores. Early math skills are also a strong predictor of success in other subjects, like reading and science, and even grade retention from kindergarten through eighth grade.² Math skills are in high demand in the labor market. Among the fastest growing jobs are those that require quantitative skills.³ Despite this evidence for how much math matters, state policy and support for strengthening math instruction severely lags nationwide.

To improve math instruction, we must bolster the capacity of teachers, especially before they enter classrooms. The solution starts with state policies to ensure strong teacher preparation.

The stakes for students in Wisconsin

In Wisconsin, 23% of 4th grade students lack basic math knowledge and skills based on the most recent National Assessment of Education Progress (NAEP). That number falls precipitously for some of Wisconsin's historically underserved students. This means 12,914 students in 4th grade likely cannot perform skills such as locating numbers on a number line or subtracting multidigit whole numbers.

2024 NAEP Wisconsin Grade 4 Math Results



Mathematics knowledge is highly cumulative in nature, meaning that students who struggle to learn foundational math concepts are likely to continue to struggle well into middle and high school.⁴ **A student who struggles in math early on may never catch up.**

¹ Werner, K., Acs, G., & Blagg, K. (2024). *Comparing the Long-Term Impacts of Different Child Well-Being Improvements*. Urban Institute. https://www.urban.org/sites/default/files/2024-03/Comparing_the_Long-Term_Impacts_of_Different_Child_Well-Being_Improvements.pdf.

² Claessens, A., & Engel, M. (2013). How important is where you start? Early mathematics knowledge and later school success. *Teachers College Record*, 115(6), 1-29.

³ U.S. Bureau of Labor Statistics. (2024, August). Math occupations. *Occupational Outlook Handbook*. <https://www.bls.gov/ooh/math/>.

⁴ Watts, T. W., Duncan, G. J., Siegler, R. S., & Davis-Kean, P. E. (2014). The groove of growth: How early gains in math ability influence adolescent achievement. *Society for Research on Educational Effectiveness*; Siegler, R. S., Duncan, G. J., Davis-Kean, P. E., Duckworth, K., Claessens, A., Engel, M., & Chen, M. (2012). Early predictors of high school mathematics achievement. *Psychological Science*, 23(7), 691-697.

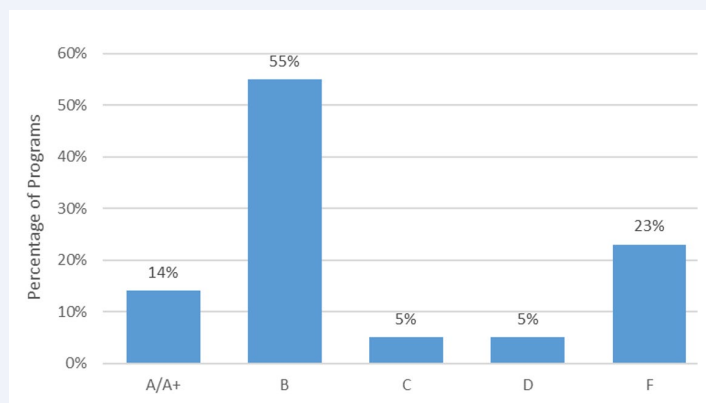
The Current Teacher Prep Landscape in Wisconsin

Elementary Math Teacher Prep

Far too many elementary teacher prep programs fail to dedicate enough instructional time to building aspiring teachers' math knowledge—leaving teachers unprepared and students underserved. Put simply, teachers need to deeply understand the math content they want students to learn and must have the specialized knowledge of how to teach it, often referred to as math pedagogy.

In Wisconsin, NCTQ evaluated 22 elementary prep programs to determine whether they dedicate enough time to key math content topics and math pedagogy. The analysis shows Wisconsin programs perform above the national average.

14% of Wisconsin programs earn an A or A+ by dedicating adequate instructional time to both math content and pedagogy



NCTQ looks for instructional hours dedicated to math pedagogy and four math content topics:

- Numbers and Operations
- Algebraic Thinking
- Geometry and Measurement
- Data Analysis and Probability

Grades are determined by the amount and distribution of instructional time

- A+** Program requires at least 150 instructional hours across the five topics and 100% of the recommended target hours for each topic
- A** Program requires at least 135 instructional hours across the five topics and at least 90% of the recommended target hours for each topic
- B** Program requires at least 120 instructional hours (80%) across the five topics
- C** Program requires at least 105 instructional hours (70%) across the five topics
- D** Program requires at least 90 instructional hours (60%) across the five topics
- F** Program requires fewer than 90 instructional hours (<60%) across the five topics

How does Wisconsin perform on the actions states can take to improve math teacher preparation?

NCTQ identified actions states should take to help improve math instruction and analyzed the extent to which states are implementing them. The chart below shows Wisconsin’s performance on policies and practices in teacher preparation the state can use to improve math instruction. NCTQ will publish a State of the States report on mathematics policy in June 2025 to provide findings on additional policy levers, including licensure tests, instructional materials, and professional learning.

✓ Yes ○ Partially ✗ No

Teacher Prep Standards	Does the state have math standards/requirements for elementary teacher prep programs that cover all four key math content topics (numbers & operations, algebraic thinking, geometry & measurement, data analysis & probability)?	✓
	Does the state require elementary prep programs to address math-specific pedagogy?	✓
Prep Program Approval	Does the state specifically require the review of syllabi and/or coursework for elementary and/or secondary math courses to determine the integration of all math standards as part of the program review process?	✗
	Does the state require the inclusion of math experts in the review of teacher prep programs?	✗
	Does the state use math licensure test pass rate data as part of the program renewal process?	✗
	Does the state maintain full authority over prep program renewal and not permit outside entities to make the final decision on program renewal?	✓

Recommendations for Wisconsin

Teacher prep standards:

- Require that all elementary teacher prep programs dedicate adequate course time to mathematics.

Program approval:

- Review syllabi as part of the program renewal processes to determine the integration of all math content standards and pedagogy.
- Require math experts on site visits during program renewal processes to gauge implementation of math specific pedagogical and content knowledge.
- Use math licensure test data as part of the program renewal process, identifying a specific target (more than 25% do not pass on the first attempt) that would raise a warning for program reviewers.

Questions? Contact Ron Noble, Chief of Teacher Prep at ron.noble@nctq.org.

Teacher Prep Program Grades in Wisconsin

School	Program Level	Grade	Instructional Hour Targets for Math Content and Pedagogy			
			Numbers & Operations + Algebraic Thinking (combined)	Geometry & Measurement	Data Analysis & Probability	Math Pedagogy
Alverno College	UG	F	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Fully Meets (90 hours)
Alverno College	G	F	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Fully Meets (45 hours)
Carroll University	UG	B	Approaches (60 hours)	Fully Meets (60 hours)	Does Not Meet (0 hours)	Fully Meets (60 hours)
Carthage College	UG	F	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Fully Meets (60 hours)
Concordia University Wisconsin	UG	B	Does Not Meet (46 hours)	Fully Meets (27 hours)	Approaches (14 hours)	Fully Meets (49 hours)

Note: Programs that meet or exceed the instructional target earn a "Fully Meets." Programs that provide at least 90% of the instructional target earn an "Approaches. For more information about instructional hour targets, review NCTQ's methodology and scoring rubric [here](#).

School	Program Level	Grade	Instructional Hour Targets for Math Content and Pedagogy			
			Numbers & Operations + Algebraic Thinking (combined)	Geometry & Measurement	Data Analysis & Probability	Math Pedagogy
Edgewood College	UG	D	Does Not Meet (30 hours)	Does Not Meet (17 hours)	Does Not Meet (11 hours)	Does Not Meet (32 hours)
Maranatha Baptist University	UG	B	Does Not Meet (56 hours)	Does Not Meet (17 hours)	Does Not Meet (11 hours)	Fully Meets (45 hours)
Marian University	UG	C	Does Not Meet (49 hours)	Fully Meets (43 hours)	Does Not Meet (0 hours)	Approaches (43 hours)
Marquette University	UG	CBD	Could not be determined	Could not be determined	Could not be determined	Could not be determined
St. Norbert College	UG	B	Fully Meets (114 hours)	Does Not Meet (13 hours)	Fully Meets (20 hours)	Does Not Meet (33 hours)
University of Wisconsin - Eau Claire	UG	B	Fully Meets (99 hours)	Fully Meets (32 hours)	Does Not Meet (1 hours)	Does Not Meet (34 hours)
University of Wisconsin - Green Bay	UG	B	Does Not Meet (53 hours)	Fully Meets (31 hours)	Fully Meets (36 hours)	Fully Meets (90 hours)
University of Wisconsin - La Crosse	UG	B	Approaches (60 hours)	Fully Meets (50 hours)	Does Not Meet (11 hours)	Fully Meets (45 hours)
University of Wisconsin - Madison	UG	B	Does Not Meet (56 hours)	Does Not Meet (11 hours)	Fully Meets (16 hours)	Fully Meets (52 hours)
University of Wisconsin - Milwaukee	UG	A+	Fully Meets (77 hours)	Fully Meets (39 hours)	Fully Meets (38 hours)	Fully Meets (117 hours)
University of Wisconsin - Oshkosh	UG	A	Approaches (60 hours)	Fully Meets (46 hours)	Approaches (14 hours)	Fully Meets (45 hours)
University of Wisconsin - Parkside	UG	B	Does Not Meet (50 hours)	Fully Meets (30 hours)	Fully Meets (30 hours)	Fully Meets (99 hours)
University of Wisconsin - Platteville	UG	F	Does Not Meet (41 hours)	Fully Meets (33 hours)	Does Not Meet (3 hours)	Does Not Meet (13 hours)
University of Wisconsin - River Falls	UG	B	Fully Meets (75 hours)	Fully Meets (33 hours)	Does Not Meet (12 hours)	Fully Meets (60 hours)

School	Program Level	Grade	Instructional Hour Targets for Math Content and Pedagogy			
			Numbers & Operations + Algebraic Thinking (combined)	Geometry & Measurement	Data Analysis & Probability	Math Pedagogy
University of Wisconsin - Stevens Point	UG	A+	Fully Meets (74 hours)	Fully Meets (34 hours)	Fully Meets (18 hours)	Fully Meets (45 hours)
University of Wisconsin - Superior	UG	B	Does Not Meet (47 hours)	Approaches (23 hours)	Does Not Meet (5 hours)	Fully Meets (61 hours)
University of Wisconsin - Whitewater	UG	B	Does Not Meet (45 hours)	Fully Meets (30 hours)	Fully Meets (15 hours)	Fully Meets (45 hours)
Wisconsin Lutheran College	UG	F	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Does Not Meet (0 hours)	Fully Meets (60 hours)