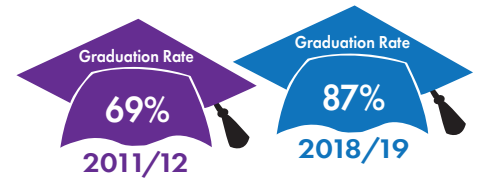
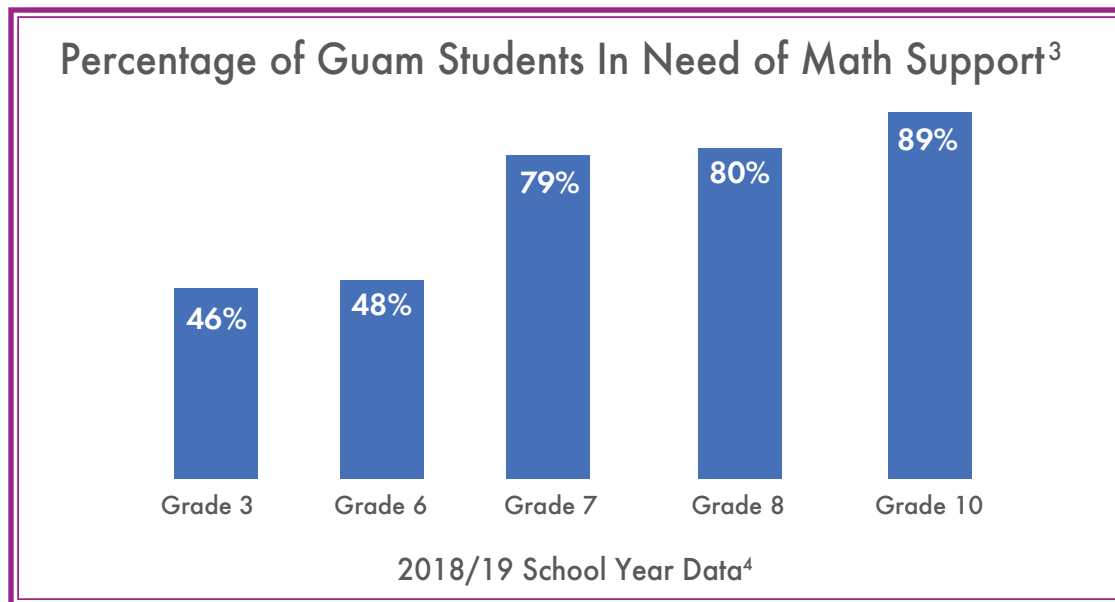


A Fact Sheet to Support Guam Teachers' Professional Learning and Coaching

Guam's students have shown achievement gains over the last decade, including graduation rates rising from 69 percent in 2011/12 to 87 percent in 2018/19.¹ The Guam Department of Education's (GDOE) strategic plan aims to build on these gains and ensure that all K–12 students are on track for graduation and college and career success.²



One area of focus for GDOE's five-year plan is to help more students increase their math proficiency. Recent ACT Aspire assessment results indicate that students need additional math support as they progress through middle and high school.



GDOE is focused on supporting math teaching and learning across critical transition periods for students, such as when students move from elementary to middle school. This focus aligns with research on the importance of targeting both elementary and middle school math instruction⁵ to improve student proficiency. Increasing the continuity and rigor of curriculum and instruction at this transition point will support students' math achievement over time and their postsecondary readiness.^{6, 7, 8}

Addressing This Need: Professional Learning and Coaching for Teachers

To support students' math learning during their transition from elementary to middle school, GDOE and REL Pacific are partnering to facilitate professional learning and coaching for grades 5 and 6 teachers on evidence-based math teaching strategies. This fact sheet provides examples of practices teachers can explore and an evidence-based process teachers and coaches can use for effective professional learning.

Evidence-based Practices to Help Students Increase Math Proficiency

GDOE leaders believe the grade-level decline in math achievement is due in part to inconsistencies in teaching foundational math skills including problem solving. Problem solving serves as an important foundation for students' math proficiency in elementary and middle school and their later success in advanced math classes.⁹

During the REL Pacific sessions, Guam teachers will learn about math practices like the ones outlined below, which have a research-based rationale that demonstrates they can increase students' proficiency with math problem solving. These practices are based on the recommendations of the What Works Clearinghouse Practice Guide, *Improving Mathematical Problem Solving in Grades 4 Through 8*.

1) Prepare problems and use them in whole-class instruction.

- a. Include both routine and non-routine problems in problem-solving activities.
- b. Ensure that students will understand the problem by addressing issues students might encounter with the problem's context or language.
- c. Consider students' knowledge of mathematical content when planning lessons.

Learn more about this recommendation: https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/MPS_PG_043012.pdf#page=16

2) Assist students in monitoring and reflecting on the problem-solving process.

- a. Provide students with a list of prompts to help them monitor and reflect during the problem-solving process.
- b. Model how to monitor and reflect on the problem-solving process.
- c. Use student thinking about a problem to develop students' ability to monitor and reflect.

Learn more about this recommendation: https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/MPS_PG_043012.pdf#page=23

3) Teach students how to use visual representations.

- a. Select visual representations that are appropriate for students and the problems they are solving.
- b. Use think-alouds and discussions to teach students how to represent problems visually.
- c. Show students how to convert the visually represented information into mathematical notation.

Learn more about this recommendation: https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/MPS_PG_043012.pdf#page=29

4) Expose students to multiple problem-solving strategies.

- a. Provide instruction in multiple strategies.
- b. Provide opportunities for students to compare multiple strategies in worked examples.
- c. Ask students to generate and share multiple strategies for solving a problem.

Learn more about this recommendation: https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/MPS_PG_043012.pdf#page=38

5) Help students recognize and articulate mathematical concepts and notation.

- a. Describe relevant math concepts and notation, and relate them to the problem-solving activity.
- b. Ask students to explain each step used to solve a problem in a worked example.
- c. Help students make sense of algebraic notation.

Learn more about this recommendation: https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/MPS_PG_043012.pdf#page=45



Learn More

The REL Pacific website features our latest products, blog posts, videos, and links to other REL resources. Check it out at <https://ies.ed.gov/ncee/rel/region/pacific>.

For more information, questions, or requests for assistance, email us at relpacific@mcrel.org.

Five-Step Process for Professional Learning

During the REL Pacific sessions, coaches and teachers will use this five-step, inquiry-action process to support high-quality collaborative learning.

1. Debrief

Teachers share instructional strategies and activities they have used in their classrooms and explain how their students responded.

2. Define

Coaches identify the focus and the specific goals of the current learning session.

3. Explore

Teachers learn about the new instructional concepts and compare them with their current classroom practices.

5. Reflect & Plan

Teachers reflect on how the new learning relates to previous practices and plan to implement the new activities and strategies in their classrooms.

These practices are based on the recommendations of the IES Regional Educational Laboratory Program Facilitator's Guide, *Professional Learning Community: Improving Mathematical Problem Solving for Students in Grades 4 through 8*.

4. Experiment

Teachers collaborate to practice applying the new activities and strategies they've learned.

Notes:

- ¹Fernandez, J. (2019). *Annual state of public education report SY 18–19*. Guam Department of Education. <https://docs.google.com/a/gdoe.net/viewer?a=v&pid=sites&srcid=Z2RvZS5uZXR8Z2RvZXxneDozNTA5ZTFIZGFhODVIZDc1>
- ²Guam Department of Education Board of Education. (2022). *Five-year Strategic Plan: I CHalân-ta mo'na "Our path forward."* Guam Department of Education. [https://www.gdoe.net/files/user/58/file/GDOE%20Strategic%20Plan%20-%20%20%20CHal%20C3%A5n-ta%20Mo%E2%80%99na%20Adopted%204_19_22\(1\).pdf](https://www.gdoe.net/files/user/58/file/GDOE%20Strategic%20Plan%20-%20%20%20CHal%20C3%A5n-ta%20Mo%E2%80%99na%20Adopted%204_19_22(1).pdf).
- ³Fernandez, J. (2019). *Annual state of public education report SY 18–19*. Guam Department of Education. Retrieved from <https://docs.google.com/a/gdoe.net/viewer?a=v&pid=sites&srcid=Z2RvZS5uZXR8Z2RvZXxneDozNTA5ZTFIZGFhODVIZDc1>
- ⁴Due to disruptions caused by the COVID-19 pandemic, ACT Aspire results for 2020 and 2021 are unavailable. Beginning in 2022, GDOE will transition to Smarter Balance as their districtwide assessment.
- ⁵Schiellack, J., & Seeley, C. L. (2010). Contemporary curriculum issues: Transitions from elementary to middle school math. *Teaching Children Mathematics*, 16(6), 358–362.
- ⁶Kaur, T., McLoughlin, E., & Grimes, P. (2022). Mathematics and science across the transition from primary to secondary school: A systematic literature review. *International Journal of STEM Education*, 9(1), 1–23.
- ⁷Lee, J. (2012). College for all: Gaps between desirable and actual P–12 math achievement trajectories for college readiness. *Educational Researcher*, 41(2), 43–55.
- ⁸Shannon, L., Cosby, A., Rentz, B., Henschel, M., Arens, S. A., & Holquist, S. E. (2021). *Using high school data to predict college readiness and early college success on Guåhan (Guam)* (REL 2021–073). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Pacific. Retrieved from <https://ies.ed.gov/ncefe/rel/Project/4604>.
- ⁹Woodward, J., Beckmann, S., Driscoll, M., Franke, M., Herzig, P., Jitendra, A., Koedinger, K. R., & Ogbuehi, P. (2012). Improving mathematical problem solving in grades 4 through 8: A practice guide (NCEE 2012-4055). National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. <https://files.eric.ed.gov/fulltext/ED532215.pdf>