

Beyond Algorithms: Developing Mathematical Understanding in our Lower School Students

Over the course of the 17-18 school year, Porter Gaud's Lower School began seeking answers to a trend we were seeing in some of our testing results in math. We wanted to better understand our students' knowledge of numbers and their operations, so we asked: Can our students explain a concept or process to others in a manner that shows conceptual and procedural understanding? Do they understand why and how they got to their answers? Are we building math learners with flexible and deep mathematical understanding that will serve them well in the future?

In addition to conducting observations, evaluating teaching materials, and analyzing our existing curriculum, we explored testing data to better understand trends and patterns in our performance. After an exhaustive study of performance trends over the last five years, we decided to make the following changes and improvements to instructional methods, curriculum, materials, and assessment.

- This fall, teachers are implementing number talks in grades 1-4. Number talks are directly aimed at improving number sense and increasing mathematical fluency and flexibility.
- Porter-Gaud offers a leveled math program in grades 1-12. In grades 1-4, quarterly assessments provide data to inform student groupings, which are fluid throughout the school year. In addition to STAR math testing at each quarter, we will now use internally developed mathematics benchmark tests that emphasize number and procedural sense to inform our math groups and the instructional plan for each group.
- Porter-Gaud will pilot an Instructional Rounds program this year focused on number sense. Our "Problem of Practice" will be improving students' number sense by deepening their conceptual understanding, moving beyond algorithms for solving problems.
- Porter-Gaud School is beginning a curriculum mapping initiative this year, which will engage all teachers in considering the essential knowledge and key skills of each unit of math instruction. A formal math materials review, lead by our Lower School Math Specialist, will accompany this process.

Follow-Up and Further Data Analysis

We are committed to prioritizing our long-term goal of ensuring deeper learning in Lower School mathematics over the next several years. With ongoing guidance from our Lower School Math Specialist, Academic Dean, and Lower School Division Head, we have the leadership and support systems in place to ensure the consistent and meaningful execution of our plan. We are already beginning to see our math classrooms changing into even more dynamic learning spaces where students verbalize their thinking processes, visualize math through alternative models and methods, and ultimately build a resilient base of conceptual understanding to support their future learning.