

## Mathematics at Great River School

*“Here is an essential principle of education: to teach details is to bring confusion; to establish the relationship between things is to bring knowledge.”*

*~Montessori, From Childhood to Adolescence*

Great River embraces a uniquely Montessori approach to Mathematical Instruction, an approach based on the needs of the adolescent. The rhythm of the class is structured by the Montessori idea of the Three Period Lesson.

**The Three Period Lesson:** At its core, the three period lesson begins with inspiration leading to exploration concluding with exposition. The term Lesson refers to both the overarching units lasting weeks and the work of a single class.

The Three Period Lesson begins with a presentation. Presentations are the point of departure. They are the most familiar aspect of the curriculum for many students, in many ways similar to lectures. Presentations differ by being more focused, both in audience and in scope. In the first period, key terms and concepts are presented to prepare the student for the work ahead.

During the middle period student explore and investigate the mathematics at hand. Here is where students work directly with mathematics, discovering or investigating new concepts. Here students practice being mathematicians. They often work on their own, but there are opportunities to work in small groups. The teacher’s role is to guide students through their work and help them summarize and communicate their discoveries. Second period work includes seminars, labs, projects, artwork, homework, reading, research, and writing.

The third period is a time for sharing and evaluation. This can include projects, skits, and artwork as well as more traditional papers and exams. In the third period, work is summed up, shared, and evaluated. Here we complete a cycle of learning.

**The Seminar:** Seminars play a role in all three periods of learning. They can be used to introduce students to new ideas and as a way to spark interest in a new topic. In seminar, we can explore ideas together. Seminars can also be a way to share what we have discovered.

The seminar helps students develop their ability to communicate about the mathematics they are doing. In seminar, students are given a collection of problems to work on several days in advance. These problems are designed to challenge students, often requiring creative problem solving. Students share their work and questions during the seminar, learning from and with each other. In this mathematical dialogue, we create a forum for the exchange of ideas.

**International Baccalaureate (IB):** During the 11th and 12th grades, Great Rivers teaches an IB curriculum using Montessori pedagogy. GRS is one of six Montessori High Schools in the United States and we are actively working with these schools to define Montessori Education in the High School context. This work is very much alive and our program is a work in progress.

Students choose from one of three IB concentrations for their mathematics, all of which are solid preparation for University studies: Math Studies (MS), Standard Level (SL), and Higher Level (HL). Students wishing to enter the HL course must begin preparations during their sophomore year. This number is small, ranging from 1 to 5 students each year. The majority of our students take Junior Year IB mathematics. In the middle of their junior year, students will select either MS or SL for their senior year focus.