GO MATH!

Grades 6–8 © 2018

by Matthew R. Larson, Ph.D.
K–12 Curriculum Specialist for Mathematics
Lincoln Public Schools, Lincoln, Nebraska

PROFESSIONAL DEVELOPMENT

GO Math! and the Principles of Effective Mathematics Programs

All education researchers strongly agree that two components of effective mathematics programs have a positive impact on student learning: the implemented curriculum and teachers' implementation of research-informed instructional practices.

HMH GO Math!® uniquely provides both elements: a strong curriculum aligned to current expectations, and a design that robustly supports teachers' research-informed instructional practices.

Research-Informed Instructional Practices

A coherent and rigorous curriculum is one of two critical components of a mathematics program that helps ensure the success of all students. The second critical component is an instructional approach based on research-informed instructional practices. The overarching message in NCTM's publication *Principles to Actions: Ensuring Mathematical Success for All* is that "effective teaching is the nonnegotiable core that ensures all students learn mathematics at high levels" (NCTM, 2014, p. 4). NCTM offers eight research informed instructional strategies to support effective teaching and learning of mathematics. ***HMH GO Math!*** embeds those eight instructional strategies in the curriculum. These strategies are shown on the following page.

Embedded Professional Development Support

As authors we appreciate that you are being asked to teach more mathematics at deeper levels than ever before. Teaching mathematics effectively is a complex endeavor, and it takes time to integrate new instructional strategies into your practice. Toward that end ***HMH GO Math!*** embeds professional development resources into the curriculum. In a series of professional development videos, ***HMH GO Math!*** coauthor Juli Dixon models successful teaching practices and strategies in real classrooms. These videos are an invaluable resource as you work collaboratively with your colleagues to ensure that all students successfully attain the standards and that you grow in your own knowledge of mathematics and highly effective instructional strategies.

GO Math! and the Principles of Effective Mathematics Programs

	Instructional Strategies ...	In *GO Math!* ...
1	**Establish mathematics goals to focus learning.** Effective teaching establishes clear goals, situates goals within learning progressions, and uses the goals to guide instructional decisions (NCTM, 2014, p. 12).	*The goals are clearly labeled in **HMH GO Math!** More importantly, the scope and sequence have been built around learning progressions and the big ideas of mathematics.*
2	**Implement tasks that promote reasoning and problem solving.** Effective teaching engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies (NCTM, 2014, p. 17).	*The 5E lesson framework in **HMH GO Math!** helps ensure that students explore worthwhile activities in every lesson to develop their understanding of mathematical concepts.*
3	**Use and connect mathematical representations.** Effective teaching engages students in making connections to deepen understanding of concepts and procedures and as tools for problem solving (NCTM, 2014, p. 24).	*Students interactively explore new concepts using pictorial representations, a variety of tools, and approaches in order to achieve proficiency with symbolic mathematics.*
4	**Facilitate meaningful mathematical discourse.** Effective teaching facilitates discourse among students to build shared understanding by analyzing and comparing student approaches and arguments (NCTM, 2014, p. 29).	***Math Talk** is a central feature of **HMH GO Math!** Question prompts and sample dialogue in the Teacher Edition support you as you engage students to develop their conceptual understanding.*
5	**Pose purposeful questions.** Effective teaching uses purposeful questions to assess and advance students' reasoning and sense making (NCTM, 2014, p. 35).	*The Teacher Edition has many question prompts you can use to generate mathematical discourse and reflection, determine what students currently know, and advance their learning. These prompts allow you to transform your classroom into an interactive, student-centered learning environment.*
6	**Build procedural fluency from conceptual understanding.** Effective teaching builds fluency with procedures so that students become skillful in using procedures flexibly as they solve contextual and mathematical problems (NCTM, 2014, p. 42).	*The goal in **HMH GO Math!** is for students to learn efficient methods for solving procedures based on understanding. Student learning of traditional algorithms starts with concrete models connected to underlying concepts. Eventually students draw their own representations and finally work with efficient algorithms so their proficiency prepares them to learn future mathematics.*
7	**Support productive struggle in learning mathematics.** Effective teaching consistently provides students with opportunities	*The 5E lesson framework supports students' continued engagement with mathematical concepts. Students have ample time to explore concepts prior to the explain phase of the lesson and are supported with significant guided practice as part of the elaborate phase.*
8	**Elicit and use evidence of student thinking.** Effective teaching uses evidence of student thinking to assess progress and to adjust instruction continually in ways that support and extend learning (NCTM, 2014, p. 53).	*Question prompts as well as Are You Ready?, Lesson Quizzes, Ready to Go On?, and Assessment Readiness in each module, and Summative Assessment options at the end of each unit provide teachers continual and real-time options to use evidence of student thinking to adjust and guide instruction. These diagnostic assessments help teachers determine the appropriate differentiated instructional materials needed to support all students.*

GO Math! and the Principles of Effective Mathematics Programs

The Curriculum

The power of the curriculum to affect how much students learn in mathematics is well established (Marzano, 2003; Schmoker, 2011). The National Council of Teachers of Mathematics (2014, p. 70) has argued that "an excellent mathematics program includes curriculum that develops important mathematics along coherent learning progressions." That is precisely how we designed ***HMH GO Math!*** Its scope and sequence are designed in accord with the latest research on learning progressions (Clements and Sarama, 2014). The curriculum makes connections between and among various mathematical topics, and it is coherent, rigorous, and focused. The favorable outcome is that students learn each grade level's important mathematics at a deep level while simultaneously connecting each lesson to the bigger ideas of mathematics. In ***HMH GO Math!*** an optimal proportion of the tasks students work on to develop their understanding as well as their proficiency require complex thought and reasoning—the tasks are not merely harder.

Contact your HMH Account Executive for more information about *GO Math!* Middle School Grades 6–8 © 2018 and to preview resources as they are available.

Connect with us:

Houghton Mifflin Harcourt