

# Strengths-Based TEACHING AND LEARNING in Mathematics



TEACHING  
TURNAROUNDS  
FOR GRADES K-6

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Please enjoy this complimentary excerpt from *Strengths-Based Teaching and Learning in Mathematics*. This excerpt outlines effective mathematics teaching principals and how to utilize strengths-based instruction.

**LEARN MORE** about this title, including Features, Table of Contents, and Reviews.

# Planning Effective Strengths-Based Instruction

When we design effective mathematics instruction within heterogenous classrooms, we promote strengths-based beliefs about our students and provide opportunities for all our students to engage in meaningful mathematics learning. Students can and do learn during heterogeneous instruction, particularly when that instruction is high quality and evidence based (Burris, Heubert, & Levin, 2006). The National Council of Teachers of Mathematics' (NCTM, 2014) *Principles to Actions* outlines eight research-based teaching practices that need to be present in every mathematics lesson for each and every student to learn meaningfully.

## EFFECTIVE MATHEMATICS TEACHING PRACTICES

EFFECTIVE MATHEMATICS TEACHING PRACTICES <i>PRINCIPLES TO ACTIONS: ENSURING MATHEMATICAL SUCCESS FOR ALL (NCTM, 2014)</i>	
Establish mathematics goals to focus learning.	Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.
Implement tasks that promote reasoning and problem solving.	Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.
Use and connect mathematical representations.	Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.
Facilitate meaningful mathematical discourse.	Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.
Pose purposeful questions.	Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.
Build procedural fluency from conceptual understanding.	Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.
Support productive struggle in learning mathematics.	Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage them in productive struggle as they grapple with mathematical ideas and relationships.
Elicit and use evidence of student thinking.	Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

As you read the descriptions about these teaching practices, the tendency might be to check off particular parts of your lesson as evidence of the practice. However, the key is to *plan* deliberately and mindfully for how each lesson will incorporate the teaching practices. As you consider the practices from a strengths-based approach, imagine what this emphasis might look like in a lesson.

**STRENGTHS-BASED APPROACH TO THE EFFECTIVE TEACHING PRACTICES**

EFFECTIVE TEACHING PRACTICES (NCTM, 2014)	WHAT A TEACHER IN A STRENGTHS-BASED CLASSROOM DOES	WHAT A STUDENT IN A STRENGTHS-BASED CLASSROOM HEARS	WHAT A STUDENT IN A STRENGTHS-BASED CLASSROOM FEELS
Establish mathematics goals to focus learning.	Teachers let students know that they can achieve the goal and makes references to this goal throughout the lesson.	“Yesterday we learned about _____. Today, we are going to build on what you learned.”	“I understand what I am supposed to do and why I am learning this material.”
Implement tasks that promote reasoning and problem solving.	Teachers ensure that all students have opportunities to solve problems and hear other students’ reasoning.	“Both of you thought of unique and different ways to approach the problem. It is valuable to hear one another’s ideas about solving problems. Let’s have you both share your thinking with the class.”	“I am working on a task with other students. We are not expected to know the answer right away, but we are expected to persevere. I explain my reasoning. I can ask questions, use manipulatives, and sketch representations to explain my ideas.”
Use and connect mathematical representations.	Teachers encourage students to identify and use representations that make sense to them. They leverage the students’ strengths by bridging each strength to new learning.	“You are really great at using the base ten blocks to show your thinking. Let’s use your representation to connect it to the place value mat. Let’s place your representation right on the mat so we can show your thinking to the class.”	“There are many different kinds of manipulatives and materials that I can pick from and use when I am working on a problem.”
Facilitate meaningful mathematical discourse.	Teachers are explicit about how they want students to communicate with one another. They vary the ways that students share their strengths and vary their opportunities to identify strengths.	“I am noticing each of the groups thought of completely different ways to solve the task. I would like us to engage in a group-to-group share. I will match your group up with another group to share your ideas. After both groups have shared, I want you to point out a strength you heard from the other group and explain why it is a strength.”	“I can talk to my classmates at different points throughout the lesson. I am expected to share my ideas, listen to my peers, and ask good questions.”
Pose purposeful questions.	Teachers plan for and ask questions that showcase all students’ thinking. They prompt students to share how others’ ideas promote understanding.	“What about _____’s explanation and representation helps you understand their approach?”  “How did your thinking change as a result of someone else’s explanation?”	“My teacher asks lots of questions. She listens to what we say and then asks more questions. She also encourages us to ask each other questions.”
Build procedural fluency from conceptual understanding.	Teachers recognize that fluency is built over time and facilitate opportunities for students to reflect on how they use flexible thinking.	“Which strategy is easiest for you to use? Why?”	“I don’t feel rushed. I am expected to explain my strategy and know why I am using a particular strategy.”

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EFFECTIVE TEACHING PRACTICES (NCTM, 2014)	WHAT A TEACHER IN A STRENGTHS-BASED CLASSROOM DOES	WHAT A STUDENT IN A STRENGTHS-BASED CLASSROOM HEARS	WHAT A STUDENT IN A STRENGTHS-BASED CLASSROOM FEELS
Support productive struggle in learning mathematics.	Teachers recognize that students have different tolerance levels for productive struggle. They consistently tell students they appreciate their hard effort.	“I am noticing that many of us are struggling productively. I see a lot of students trying different ways to solve the problem! Let’s take a moment to share with a partner how you are working toward solving the problem.”	“I am expected to try my hardest and let my teacher know if I get too frustrated. My teacher believes in me. I am ready to try another way when I seem to get stuck.”
Elicit and use evidence of student thinking.	Teachers ask for evidence of students’ thinking from correct, novel, and creative thinking.	“Please tell me more about your strategy here. This is very interesting thinking.”	“My teacher likes to hear what I am thinking. Even if I am not sure how to explain my ideas, I am encouraged to explain what I can.”

*Strengths-Based Teaching and Learning in Mathematics: Five Teaching Turnarounds for Grades K–6* by Beth McCord Kobett and Karen S. Karp. Copyright © 2020 by Corwin Press, Inc. All rights reserved.