

MATH MOMENTS

Learning the 8 mathematical practices!

8 MATHEMATICAL PRACTICES

- 1 Make Sense of Problems and Persevere in Solving Them
- 2 Reason Abstractly and Quantitatively
- 3 Construct Viable Arguments and Critique the Reasoning of Others
- 4 Model with Mathematics
- 5 Use Appropriate Tools Strategically
- 6 Attend to Precision
- 7 Look For and Make Use of Structure
- 8 Look For and Express Regularity in Repeated Reasoning

Resource Section:

**Here you will find some valuable resources. These might be in the form of an article, tips, or website like the video clip below from the Teaching Channel.

Just copy/paste the URL in your browser.

https://www.teachingchannel.org/videos/owning-the-common-core#video-sidebar_tab_video-guide-tab

There are 8 Mathematical Practices in all. Every month the Math Moments newsletters will be highlighting one mathematical practice in order to provide you an opportunity to learn each one individually.

There are 2 types of mathematical standards which are;

Content standards--these include the mathematical knowledge and skills students should learn.

Process standards--these specify the mathematical ways of thinking students should develop while learning mathematics content or otherwise known as the 8 mathematical practices.

Why do we need standards for Mathematical Practice?

Being prepared to compete in an increasingly complicated and unpredictable world means developing the stamina and disposition to puzzle through totally unfamiliar problems.

When the real world throws us a problem, it never asks what chapter we've just studied! Competing in a knowledge-based economy requires great adaptability to unexpected challenges.

Preparation for this world requires learning to approach new and unfamiliar problems with the confident "I can puzzle this out" attitude. Students need to develop a disposition to tackle problems with only the knowledge they have (or can find on their own) without a pre-learned solution method.

**Mathematical Practices
are essential mathematical habits of
mind and action!**

The screenshot shows a video player interface for a lesson titled "Look for and make use of structure". The video content includes a slide with the text: "I can see and understand how numbers and spaces are organized and put together as parts and wholes." Below this, there are sections for "Numbers" and "Spaces" with diagrams. The video player also shows a "Guide" sidebar with a "Lesson Objective" and "Questions to Consider".



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mathematics

Inside Mathematics website illuminates the mathematical practice standards with video excerpts of lessons. Just as with content standards, not every lesson reflects all elements of the individual standards for mathematical practice. By representing examples from different classrooms for each standard, they emphasize different ways teachers may enact these mathematical practices in their classrooms, with their particular learners.

How do the Mathematical Practices look like in a lesson?

As your child works through their math problems, they will be exposed to these practices. Below is an example of a math lesson where the bracketed MP.3 indicates math practice #3 (Construct Viable Arguments/Critique the Reasoning of Others). Although the practice is presented here individually, it's important to keep in mind that many practices can, and should, be together in a lesson for they are interconnected.

T: (Project or draw the following image.) Look at my new drawing and the multiplication sentence I wrote to represent it. Check my work by writing an addition sentence and counting to find the total number of objects.

MP.3  $3 \times 4 = 12$

S: (Write $4 + 4 + 3 = 11$.)

T: Use your addition sentence as you talk to your partner about why you agree or disagree with my work.

S: I disagree because my addition sentence equals 11, not 12. → It's because that last group doesn't have 4 circles. → You can do multiplication when the groups are equal. → Here, the groups aren't equal, so the drawing doesn't show 3×4 .

EACH ISSUE WILL INCLUDE:

What does the task look like?
 What does the teacher do?
 What do they look like at each level? (Elementary, Middle or HS)
 In what way can I help at home?
 What questions should I ask my child or questions to ask myself?
 IN THE NEXT ISSUE...
MATHEMATICAL PRACTICE #1

Relationships among the practices!

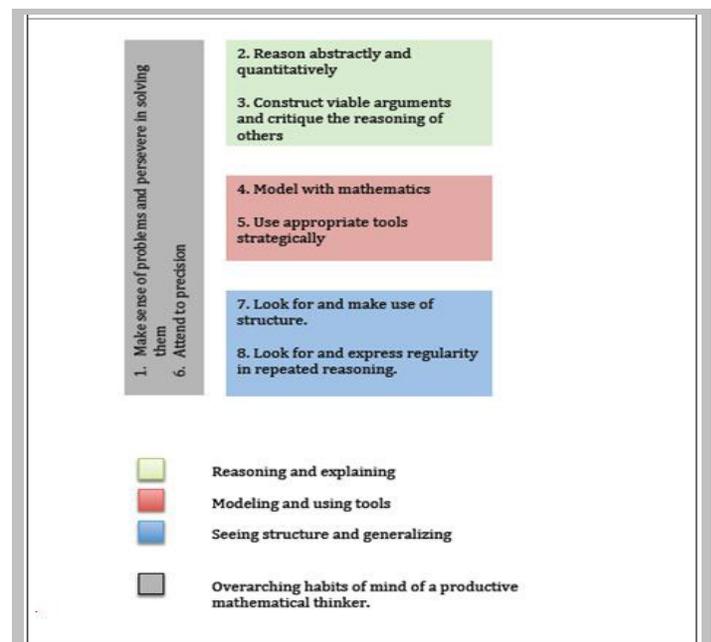
As seen in the diagram below;

Practices 1 and 6 serve as overarching habits of mind in mathematical thinking and are pertinent to all mathematical problem solving.

Practices 2 and 3 focus on reasoning and justifying for oneself as well as for others and are essential for establishing the validity of mathematical work.

Practices 4 and 5 are particularly relevant for preparing students to use mathematics in their work.

Practices 7 and 8 involve identifying and generalizing patterns and structure in calculations and mathematical objects. These practices are the primary means by which we separate abstract, big mathematical ideas from specific examples.



"The Standards for Mathematical Practice describe varieties of expertise that mathematic educators at all levels should seek to develop in their students."
 —COMMON CORE STATE STANDARDS

"The level and kind of thinking in which students engage determines what they will learn."

—Hiebert, Carpenter, Fennema, Fuson, Wearne, Murray, Oliver, & Human