

Coaching Tools to Support CCSS Content and Mathematical Practices

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**Leading for Mathematical
Proficiency Framework, p. 1**

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Standards for
Mathematical
Practice

*“What do each one of the mathematical
practices look like in action?”*

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- Select a card and read the scenario to your group.
- Discuss which **Mathematical Practice** is represented in the scenario.

**Standards for
Mathematical Practice**

- SMP 1 - D
- SMP 2 - H
- SMP 3 - A
- SMP 4 - E
- SMP 5 - B
- SMP 6 - F
- SMP 7 - C
- SMP 8 - G

**Standards for Mathematical
Practice**

- When you add $7 + 7$, you get 14. When you make the first number 1 more and the second number 1 less, you get the same answer.
 - $7 + 7 = 14$
 - $8 + 6 = 14$
- Is this true for $5 + 5$?
- Is it true for other addition problems?
- What else do you notice about this pattern?

One Up, One Down, p. 2

From Elementary and Middle School Mathematics: Teaching Developmentally (8E)

Standards for Mathematical Practice → Require → **Shifts in Classroom Practice**

“How can we (teachers & coaches) provide optimal learning opportunities for students to become mathematically proficient?”

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Shifts in Classroom Practice, p. 3

Shift 1: From same instruction toward differentiated instruction.

- Same instruction for all students. → Differentiated instruction, but same learning outcomes for all students.

Shift 2: From students working individually toward community of learners.

- Students work individually on tasks and seek feedback from teacher on reasonableness of strategies and solutions. → Community of learners as a part of which students hear, share, and judge reasonableness of strategies and solutions.

Shift 3: From mathematical authority coming from the teacher or textbook toward mathematical authority coming from sound student reasoning.

- Correctness of solution is determined by seeking input from teacher or textbook. → Correctness of solution is based on reasoning about the accuracy of the solution strategy.

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Shift 1: From same instruction toward differentiated instruction.

- Same instruction for all students. → Differentiated instruction, but same learning outcomes for all students.

Self-assess where you are on the first few *Shifts*.

How might you use this tool?

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Standards for Mathematical Practice → Require → **Shifts in Classroom Practice** (Planned) → Include → **Teaching Skills**

“How do we (as teacher leaders) help teachers make the shifts in classroom practice that lead to mathematical proficiency?”

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- Implementing the Standards & Shifts
- **Content and Worthwhile Tasks**
- Instructional Strategies
- **Questioning and Discourse**
- Formative Assessment
- **Differentiating Instruction for All Learners**
- Supporting English Language Learners
- **Supporting Students Who Have Special Needs**

Teaching Skills

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- Individualized & Collaborative
- Embedded in Practice
- Ongoing
- Accountability & Feedback
- Content-rich

Coaching Cycle

Coaching as Professional Development

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Standards for Mathematical Practice (Planned) → Require → **Shifts in Classroom Practice** → Include → **Content Knowledge and Worthwhile Tasks**

Tools Pages 4-7 → Shifts in Classroom Practice

Leading for Mathematical Proficiency Framework, p. 1

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Planning Tools

- 3.2 – P.I.C.S. Page (p.4)
- 3.6 – Worthwhile Task Analysis (p. 5)

Data Gathering Tools

- 3.8 – P.I.C.S. Page or MARC (p. 6)

Reflection Tools

- 3.11 – Lesson Analysis (p. 7)

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Standards for Mathematical Practice (Planned) → Require → **Shifts in Classroom Practice** → Include → **Content Knowledge and Worthwhile Tasks**

Leading for Mathematical Proficiency Framework, p. 1

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Standards for Mathematical Practice (Planned) → Require → **Shifts in Classroom Practice** → Include → **Content Knowledge and Worthwhile Tasks**

Content Knowledge and Worthwhile Tasks → Support → **Shifts in Classroom Practice**

Enacted

How might you use these tools to connect to the *Shifts in Classroom Practice*?

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Standards for Mathematical Practice (Planned) → Require → **Shifts in Classroom Practice** → Include → **Content Knowledge and Worthwhile Tasks**

Content Knowledge and Worthwhile Tasks → Support → **Shifts in Classroom Practice**

SCP #3, 4, 5, 6, 7 → Shifts in Classroom Practice

Enacted

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Shift 7: From mathematics-made-easy for students toward engaging students in productive struggle.


- Mathematics is presented in small chunks, with help provided, so that students reach solutions quickly all at once.
- Teacher poses tasks and challenges students to persevere and attempt multiple approaches to solving problems.

Wow, you solved that so quickly. → I thinking. → What strategies might you use if you don't know how to solve the problem?

Just remember PEMDAS and do problems in that order. → Let's look at another way to solve this type of problem. → I see strategies made try something different?

Shifts in Classroom Practice, p. 3

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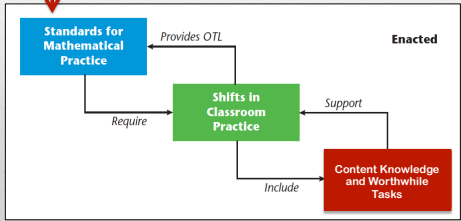


- Find a small group & some post-it notes!
- **Select a Shift: 3, 4, 5, or 6.**
- For your selected **Shift**, write a question a teacher might ask that would be an example of a classroom practice on the right side of the continuum.

Shifts in Classroom Practice, p. 3

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SMP #1, 2, 4, 8



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Mathematical Practices	Shifts in Classroom Practice
1. Make sense of problems and persevere in solving them.	1. From <i>same instruction</i> toward <i>differentiated instruction</i>
2. Reason abstractly and quantitatively.	2. From <i>students working individually</i> toward <i>community of learners</i>
3. Construct viable arguments and critique the reasoning of others.	3. From <i>mathematical authority coming from the teacher or textbook</i> toward <i>mathematical authority coming from sound student reasoning</i>
4. Model with mathematics.	4. From <i>teacher modeling 'how to'</i> toward <i>teacher modeling 'expectations for product'</i>
5. Use appropriate tools strategically.	5. From <i>content taught in isolation</i> toward <i>content connected to prior knowledge</i>
6. Attend to precision.	6. From <i>focus on correct answer</i> toward <i>focus on explanation and understanding</i>
7. Look for and make use of structure.	7. From <i>mathematics-made-easy for students</i> toward <i>engaging students in productive struggle</i>

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Shift 7: From *mathematics-made-easy for students* toward *engaging students in productive struggle*.

Mathematics is presented in small chunks, with help provided, so that students reach solutions quickly and without higher-level thinking.


Teacher poses tasks and challenges students to persevere and attempt multiple approaches to solving problems.

What strategies might you use if you don't know how to solve the problem?

SMP # 1, Make sense of problems and persevere in solving them.

Connecting Shifts to SMP

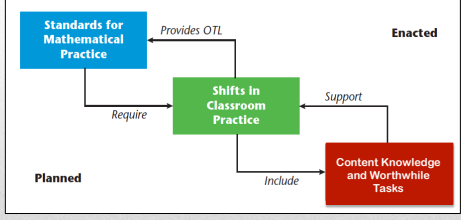
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- Look at the questions you wrote as teacher evidence of the **Shifts**.
- **Beside each question, indicate which SMP might be addressed.**

Standards for Mathematical Practice

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